



THE

# AMERICAN JOURNAL

OF THE

## MEDICAL SCIENCES.

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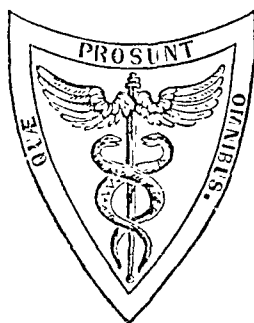
ISAAC HAYS, A.M., M.D.,

AND

I. MINIS HAYS, A.M., M.D.

NEW SERIES.

VOL. LXXVII.



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The usual British and American exchanges have been received; their individual acknowledgment is omitted for want of space.

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ARTICLE I.

THE HISTORY OF SIX CASES OF ABDOMINAL PREGNANCY.<sup>1</sup> By T. GAILLARD THOMAS, M. D., Professor of Obstetrics and Diseases of Women and Children in the College of Physicians and Surgeons, New York.

My experience in extra-uterine pregnancy extends to fifteen cases; of these seven were tubal, two interstitial, and six abdominal. All those of the last variety I propose now to relate, hoping at a future time to give an account of the instances of the first two forms which I have seen.

For the physiologist and pathologist many varieties of extra-uterine pregnancy exist which do not exist for the practitioner at the bedside. For him the ovarian, tubo-ovarian, tubo-abdominal, and other varieties are niceties beyond the appreciation of diagnosis, and he is forced to limit himself, as far as practice is concerned, to the classification of all varieties into, 1st tubal, 2d interstitial, and 3d abdominal pregnancies. These, by rational and physical signs, he may differentiate from each other, and in certain cases base the propriety of surgical interference upon his conclusion.

Although not attended by as great dangers as attach to tubal and interstitial pregnancies, the abdominal variety is a most serious aberration from normal gestation, and one which commonly destroys life.

In the first two forms the rapidly developing ovum is imprisoned in tissues which are inapt for great distention, and which rupture under its distending influence. In the third the foetal ball has at its disposal for expansion and growth the whole peritoneal cavity, the placenta encroaching in its search after nutriment upon the bladder, the omentum, the intestines, and any portion of the peritoneum within its reach.

<sup>1</sup> Read before the New York Academy of Medicine, Nov. 21, 1878.  
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The events in this form of pregnancy are the following: first, the fœtus unnaturally stretched and nourished may die in the early months of its life, become encysted, and in time be cast off through the rectum, the bladder, or the abdominal walls. Second, the pregnancy may advance to the end of the ninth month, when labour coming on nature makes a persistent effort to expel the child, but on account of there being no way of exit, fails, and the child with its envelopes is retained, and, becoming encysted, remains in its nidus for years, creating no disturbance by its presence. Third, the child shut up in its unopened shell acts as a foreign body, creates suppurative action in its envelopes, and becomes surrounded with pus in place of liquor amnii; or, the liquor amnii being absorbed, the fœtal bones become closely hugged by the walls of the cavity which contains them, and, acting as an intense irritant which sets up formation of abscesses, in this way lead to hectic fever from absorption of septic material. All these events are illustrated by cases which will be now related.

*CASE I. Abdominal Pregnancy; Death of Fœtus at an early period of gestation, and discharge through the rectum, with Recovery of Mother.*—I was called by the late Dr. W. T. Walker to see with him Mrs. R., a French lady, who, after suddenly occurring amenorrhœa of four months' duration, began to suffer from pelvic pain and severe backache. This prompted an examination, when a tumor was discovered posterior to the uterus, which was pushed forward and upward by it. No diagnosis had been made until a few days before I saw the patient, when the passage by the rectum of a very minute bone, apparently one of the metatarsal, made clear the nature of the difficulty, and announced the fact that the extra-uterine fœtus was dead.

The patient's sufferings had been so great as to have made her resort to the free use of the hypodermic injection of morphia, and this was affecting her system very prejudicially. All that was done during the time that I subsequently attended her with Dr. Walker was to persuade her to break off this habit, a most difficult task, to regulate the bowels, and to attend carefully to nutrition.

Very slowly and painfully after many months all the little fœtal bones were expelled by the rectum, and the patient entirely recovered. For three or four years, however, her health was greatly depreciated in consequence of the difficulty.

*CASE II. Abdominal Pregnancy; Death of Fœtus early in gestation; discharge through rectum, with Recovery of Mother.*—This case was almost identical with that just related, except that the diagnosis was made by art and not by nature.

Dr. Olcott, of Brooklyn, presented me to the patient, giving me no history of the case at all, and the patient being instructed to avoid all allusion to his opinion.

I found that all the symptoms of normal pregnancy existed, so that no suspicion of any aberration from it would have been entertained but for two symptoms; one, frequent and irregular attacks of metrostaxis, the other, severe pain in pelvis and back, extending down the thighs, and in some degree seeming to impede defecation.

Examining her with my mind free from bias, I made a pretty positive diagnosis of abdominal pregnancy, basing my opinion upon the fol-

lowing data: 1st. All the signs of normal pregnancy existed; mammary, gastric, menstrual, etc. 2d. The uterus though enlarged was smaller than it should have been at that period of utero-gestation. 3d. The uterus was lifted up out of the pelvis, and pushed forward by a soft, elastic tumour which did not present the history or physical aspects of an imprisoned ovarian cyst or of hæmatocele. 4th. Emboldened by these signs to probe the uterus, it did not present the appearances of being occupied by the product of conception.

Had any doubt existed in my mind, I would have urged on Dr. Olcott the introduction of a sponge tent, but I felt satisfied, and found that he had himself arrived at the same conclusion.

As the locality of the tumour, its fixation in Douglas's pouch, and the fact that none of those peculiar rending and spasmodic pains which before the fourth month usually give premonition of and probably are instrumental in producing rupture in tubal pregnancy, existed, it was decided to keep the patient under close observation, and to wait. In a short time afterwards foetal bones were discharged by the rectum, the sac gradually emptied itself, and the patient entirely recovered. I strongly suspect that the thorough examination made by Dr. Olcott and myself, produced the happy result of the death of the foetus.

CASE III. *Abdominal Pregnancy; Laparotomy performed at the end of eleventh month of gestation, with Recovery of Mother.*—On the 13th of April, 1876, Dr. James Hadden, of New York, sent to me for examination Mrs. R., aged 26 years, a native of New York State, who had been married six years and had had one child, now five years old, and two abortions, one four years, and the other two years ago.

No peculiarities had developed in connection with the pregnancy or labour of five years ago, except that during the former she had menstruated regularly with the exception of one month, and that after the latter, she had suffered from an attack of puerperal fever, which had confined her to bed for six weeks.

Seven months before the date here given, she began to suffer from nausea and vomiting, and very soon after this time she had two or three attacks of intestinal trouble, which were marked by severe pain, retching, purging, and tympanites. At her menstrual epochs metrorrhagia then developed itself. Movement always tended to develop the unpleasant symptoms, or to increase them if they already existed.

About this period Mrs. R. declares that she distinctly felt the movements of a child in her abdomen, which was quite large, and came to the conclusion that she was pregnant. As a number of obscure symptoms existed, she called on Dr. Hadden, who agreed with her in her opinion, and fixed the term of pregnancy at about three and a half months.

During February she had very distinct "bearing-down pains," and at that time it was thought that labour would come on in a few days. She had also intense backache and pains in the side and abdomen. Sometimes these were continuous, at others intermittent. They were often so severe that morphia was administered for their relief.

Upon her visit to me, April 13, 1876, the patient was much emaciated; her temperature  $101\frac{1}{2}$  to 102 towards night; the surface was dry during the day, but profuse perspirations occurred every night; and the eyes presented that peculiar brightness so commonly noticed in hectic fever. At this time she was convinced that she had been in error as to her pregnancy, yet whenever she referred to the subject of the recognition of the

foetal movements, she did so as one does who is convinced against her own convictions.

Upon examination I found that she presented an abdominal tumour as large as that created by the uterus at the full term of pregnancy. It yielded superficial fluctuation everywhere; no solid element appearing at any point, and everywhere over its surface percussion evidenced complete dullness. The linea alba was rendered dark by deposits of pigment, and the skin of the abdomen showed where great distention had created lineæ albicantiæ.

Upon vaginal examination the uterus was found anteverted, and I was much surprised to discover that it, as well as the other viscera of the pelvis, was fixed as if by an old attack of pelvic peritonitis. With some difficulty and a great deal of care, I passed a small uterine probe to the fundus, and found that the length of the uterine cavity was three inches and a half, perhaps a little more, but this was all that I attained to.

The patient, although, as I have stated, thoroughly convinced that she was not pregnant, and fully persuaded that she had an ovarian tumour, seemed so clear in her declaration and description of foetal movements in the earlier periods of her illness, that I examined the mammae very carefully and discovered in darkened areolæ and hypertrophied glands evidences which decided me upon removing a large amount, if not all, of the fluid in the tumour before committing myself to a diagnosis.

Accordingly, upon the 22d of April, I removed by the aspirator of Dieulafoy four quarts of a sero-purulent fluid which contained albumen in large quantities, and resembled very closely fluid from an ovarian cyst, the walls of which have undergone inflammatory action. This, being submitted for examination to an excellent microscopist, was declared by him to present corpuscles which he believed to be ovarian.

I should have removed a larger amount of fluid, but when this had been withdrawn no more would flow. Believing that I had taken enough to enable me to make a complete chemical and microscopic examination, I withdrew the needle and found that the flow had been checked by obstruction of the canula by means of a pellet of white and dense lymph.

Palpation of the tumour now revealed the presence of a large solid mass within it, which was so movable that it could be rolled from side to side, and conjoined manipulation showed the uterine body fixed at the symphysis pubis, and somewhat larger than normal. I now made a positive diagnosis of abdominal pregnancy, and expressed the conviction, from which I never subsequently wavered, that the foetus floated freely in a mass of sero-pus in the peritoneal cavity, that the pelvic roof was covered by a mass of consolidated lymph, and that the intestines, pressed toward the flanks, had been covered over and fixed there by the same material. This position I felt sustained in by the following facts: 1st, the existence of nausea and vomiting during the early months of the patient's illness, which disappeared, giving place to, 2d, distinct foetal movements, about which the patient was so clear and confident that I could not divest my mind of a belief in their possible validity; 3d, the presence of a marked pigmentary deposit in the linea alba and the areola of the breasts; 4th, the presence of an enlarged though empty uterus, fixed, as were all the pelvic viscera, yet without evidences of pelvic peritonitis; and, 5th, the existence of a large solid body, which rolled around freely in the cavity of the abdomen. There may be those who will say that these evidences were too meagre for diagnosis. All that I have to say in reply is, that I thought otherwise, and had confidence in my belief.

The patient's family was informed of my conclusion, and gladly accepted the alternative of operation, as it was quite evident to them that death would be the inevitable result of further delay. The patient herself was left under the impression that ovariectomy was to be performed.

On the 10th of May I operated, at 3 P. M., at the residence of the patient, in the presence of Dr. Dusenberre, of Lock Haven, Penna., and Drs. Jas. B. Hunter, H. F. Walker, Charles S. Ward, S. B. Jones, and James Hadden, of New York.

The patient having been etherized, an incision was made extending from the symphysis pubis five inches upwards towards the umbilicus, and carried down to the peritoneum. Had I been operating without a firm belief in the diagnosis of abdominal pregnancy, and under an impression that an ovarian tumour existed, I should at this point have, I feel sure, been led into an error which would have lost my patient's life. The peritoneum was so much hypertrophied that I should have peeled it off from its apparently loose attachment to the abdominal walls, under the impression that it was an adherent ovarian cyst.

Cutting through it, a large amount of such fluid as I have described as removed by aspiration, flowed away, together with several ounces of white coagulated lymph, in shreds and masses. Now passing into the abdomen my right hand, I discovered the breech and legs of a large child presenting at the pelvis, and by the unoccupied hand placed outside of the abdomen, I could distinctly feel the head near the ensiform cartilage. Seizing the feet, I extracted the child, and removed all the fluid and lymph contained within the abdominal cavity.

From the navel of the child the umbilical cord ran and attached itself to the peritoneal surface at the left iliac fossa. It was severed near the peritoneum, and the child removed. I now lifted the abdominal walls and examined the empty cavity of the abdomen. Nowhere could any viscus be discovered, except at the pelvic brim where the uterus could be seen anteverted, and fixed by a copious deposit of lymph. The intestines pressed aside and backwards were everywhere similarly covered and bound down. A large empty cavity, extending from the diaphragm above, to the true pelvis, presented itself to the view of my associates and myself. The placenta could not be seen, although the attachment of the cord showed where it must necessarily have been.

In a case of tubal pregnancy, in which I removed the foetus by cutting through the vagina about a year before this, I very nearly lost my patient from hemorrhage in consequence of an effort to deliver the placenta. This determined me to be very guarded as to any similar attempt here. Another fact which prompted such a conservative course was this: in removing the foetus in Mrs. R.'s case, I had scratched the peritoneum, over the promontory of the sacrum, very slightly with my finger nail, and this wound bled so freely and persistently as to offer me a foretaste of what would have occurred had I endeavoured to remove the placenta. The decision of this point constituted, I feel, a crucial one in the operation. The delay, exposure of the peritoneal cavity, tax upon nervous system, and loss of blood attending removal would, I think, have decided the progress of the case adversely.

The placenta was left alone, a large glass drainage-tube placed in the lower extremity of the incision, and this was closed by silver sutures involving the hypertrophied peritoneum. The operation, which, including closure of the abdominal walls, was completed in twenty-two minutes,



being concluded, the patient was put to bed, quieted by opium hypodermically administered, and sustained by milk. The child was found to be a finely-developed girl, thickly covered with vernix caseosa, not decomposed, measuring eighteen and a half inches in length, and weighing seven pounds. The cause of its death, which had evidently occurred some time before I was consulted, was quite evident. About its middle the funis was so tightly wrapped by a long hair, which was wound repeatedly round it, that its circulation was completely cut off.

After the operation, the temperature and pulse both subsided, the former from  $102^{\circ}$  to  $98.9^{\circ}$ , and the latter from 120 to 107. A source of constitutional irritation and toxæmia had been removed, and its evil results upon the nervous system went with it. I shall not give a day-to-day record of progress, but merely mention two important facts, and then conclude. The patient was now placed by me under the charge of Dr. S. B. Jones, who reported her as doing surprisingly well until the fourteenth day. Until this time a spontaneous drainage of sero-pus occurred through the tube, the bowels acted daily, pulse and temperature were satisfactory, and it was thought that all danger was past. On the night of the 24th of May, however, she had a slight chill, which was followed by high febrile action. The temperature went up to  $104^{\circ}$ , and the pulse to 130, and septicæmia seemed imminent. I saw her about 2 o'clock in the night, with Dr. Jones, and passing my finger deeply down into the abdomen, dislodged a mass of very fetid blood, which was washed out by a stream of warm carbolized water projected through the drainage-tube, or rather through the opening which its presence had kept patent. These antiseptic injections were kept up by Dr. Jones every eight hours, until after forty-eight hours all evidence of danger had subsided.

Still, as the placenta was retained, the abdominal wound was at one point kept open by the glass drainage-tube. Time proved the propriety of this course. Five weeks after the operation, just as we had decided to venture upon complete closure, Dr. Jones was sent for in great haste, and found a small portion of fetid placenta protruding through the abdominal opening. This he seized, and by gentle rotation removed the whole. After this the patient rapidly recovered, very soon left her bed, and now presents an appearance of such perfect health that, upon a recent visit to my office, I did not recognize her.

One or two points in connection with this case are worthy of special note, and I draw attention to them, as they may prove of value to future operators :—

1st. I believe that, had a positive diagnosis not been made before operation, the case would have ended fatally when the peritoneum was reached by the primary incision. Had it been supposed that an ovarian tumour presented itself, the peeling off of this from the abdominal walls, which would have been very easily accomplished, would likely have resulted in peritoneal sloughing and death.

2d. Had an effort at removal of the placenta been made, I think that, for reasons already assigned, disastrous consequences would have ensued.

3d. Had the abdominal wound been allowed to close by first intention, I think that the imprisonment of a putrid placenta would inevitably have created septic poisoning and its unfortunate train of consequences.

As I have omitted the daily record of pulse and temperature in this case, I will give it in the next, in order to show the gravity of such cases and the great advantage to be derived from antiseptic injections in the control of septic absorption in them.

CASE IV. *Abdominal Pregnancy; Laparotomy performed at the end of seventeenth month with Recovery of Mother.*—In November, 1877, I was consulted by Mary R., a negress, of Newark, N. J., who had been sent to me by her physician, Dr. Charles Young, of that city. She was 24 years of age, married, and had borne one child.

She gave the following history of her case: In June, 1876, the menses ceased and the abdomen began to enlarge, so that she supposed herself to be pregnant, and expected her confinement in March, 1877. At the usual time she felt the foetal movements, which continued to be perceptible until March. At that time she had a few pains lasting for two days, and some hemorrhage, but these symptoms passed off and no others appeared. After that time the movements of the child ceased entirely. The menses appeared at the next period, and have continued regular ever since, but the abdomen has not decreased in size. Upon making a physical examination the uterine probe showed the uterus to be empty,  $3\frac{1}{2}$  inches in depth. Right latero-version was found to exist, and in the abdominal cavity a large movable tumor not connected with the uterus could be distinctly felt. The diagnosis of abdominal pregnancy was made, and eight ounces of dark-red fluid were withdrawn by the aspirator. This, being examined chemically and microscopically, was pronounced by a competent microscopist to contain the ovarian corpuscle and be unquestionably the fluid of an ovarian cyst—precisely what had been reported of the fluid removed from Case III.

At the time of operation the patient measured in circumference thirty-four inches over the largest part of the tumor. The operation was performed on the 15th of November in the presence of a large number of medical gentlemen. An incision four inches in length was made, extending from the pubes upwards, was carried down through the peritoneum, but was found to pass directly over the placental attachment. The incision was therefore carried upward through the navel. A large amount of darkish-brown fluid escaped from the abdomen, and I then lifted out a well-developed, nine-pound girl. The cord was very short, and twisted so tightly upon itself as to have caused, I thought, the child's death.

The child was decomposed nowhere except about the vertex. The placenta, three times as large as it would have been in normal gestation, was attached to the bladder and anterior abdominal wall. The cord was cut short and the placenta left undisturbed, the abdominal wound being closed in such a manner as to leave an opening for its escape. Duration of operation twenty-four minutes.

The patient rallied well, and was free from nausea or other discomfort for some time. I now give the record of pulse, respiration, and temperature, as kept by Dr. Van Vorst, the House Surgeon of the Woman's Hospital, who devoted himself to the care of my patient with an assiduity and zeal for which I here render my acknowledgments.

"Patient was quieted by a hypodermic injection of ten drops of Magendie's solution of morphia, and was ordered to be kept entirely upon a milk diet. 6.30 P. M. ( $3\frac{1}{2}$  hours after operation), P. 108, R. 20, T.  $99^{\circ}$ ; axilla.

Nov. 16. 1.45 A. M., gtt. x Magendie, per orem. 8 A. M., P. 98, R. 24, T.  $99^{\circ}$ ; ord. milk  $\mathfrak{z}$ j, lime water  $\mathfrak{z}$ ss, e. 1 h. 12 M., P. 106, R. 18,

T.  $101\frac{3}{4}^{\circ}$ ; slight bloody flow from uterus; slight pain; gtt. x Magendie, per orem. 5 P. M., P. 112, T.  $102^{\circ}$ . 6 P. M., P. 108, R. 24. 10 P. M., P. 112, T.  $101^{\circ}$ .

17th. Passed a comfortable night; milk  $\bar{5}$ ij e. 1 h. 8 A. M., P. 104, R. 21, T.  $98\frac{1}{4}^{\circ}$ . 9.20 A. M.,  $100\frac{1}{5}^{\circ}$ . 12 M., P. 110, R. 22, T.  $102\frac{1}{2}^{\circ}$ . 4 P. M., T.  $101\frac{1}{2}^{\circ}$ . 6 P. M., P. 103, R. 21, T.  $99\frac{3}{4}^{\circ}$ ; ord. milk  $\bar{5}$ iv e. 2 h. 8 P. M., P. 110, T.  $101\frac{1}{2}^{\circ}$ .

18th. 8.30 A. M., P. 120, R. 16, T.  $102\frac{1}{2}^{\circ}$ ; quiniæ sulph. gr. x. 9.20 A. M., vomited. 12 M., P. 104, R. 22, T.  $103\frac{1}{2}^{\circ}$ . 2 P. M., quin. sulph. gr. x; beef extract given alternately with milk. 6 P. M., P. 111, R. 24, T.  $102\frac{3}{4}^{\circ}$ . 9 P. M., P. 124, T.  $102^{\circ}$ ; no pain or tenderness about abdomen; facies good.

19th. 8.15 A. M., P. 133, R. 28, T.  $103^{\circ}$ . 9 A. M., quin. sulph. gr. x. 10.15 A. M., vomited. 12.20 P. M., P. 126, R. 26, T.  $103\frac{3}{4}^{\circ}$ . 3 P. M., Dr. Thomas removed two stitches at lower portion of wound; a large quantity of fetid gas escaped; a catheter was inserted, and four ounces of very dark fetid fluid washed out; water strongly carbolized was then pumped in (by means of a Davidson's syringe) until it returned clear. 3.30 P. M. (immediately after the washing out was finished), T.  $100\frac{1}{4}^{\circ}$ , per vaginam. 7 P. M., P. 132, R. 24, T.  $103^{\circ}$ . 8.30 P. M., washed out; afterward T.  $103\frac{1}{2}^{\circ}$ , per orem. 10 P. M., T.  $102\frac{2}{5}^{\circ}$ ; washed out by Dr. Thomas; afterward T.  $102\frac{1}{5}^{\circ}$ . 11.15 P. M., T.  $100\frac{1}{2}^{\circ}$ . 11.30 P. M., gtt. x Magendie, per orem.

20th. 1.15 A. M., T.  $100\frac{1}{4}^{\circ}$ . 4 A. M., P. 125, R. 20, T.  $101^{\circ}$ ; washed out; fluid not very fetid; slightly bloody. 7 A. M., P. 125, R. 20, T.  $101^{\circ}$ . 8 A. M., P. 130, R. 24, T.  $100\frac{3}{4}^{\circ}$ . 9.45 A. M., P. 130, T.  $100\frac{1}{2}^{\circ}$ . 10.30 A. M., quin. sulph. gr. x, per rectum. 12 M., P. 123, R. 25, T.  $99\frac{3}{4}^{\circ}$ . 3.30 P. M., P. 120, R. 23, T.  $101^{\circ}$ . 5 P. M., P. 140, T.  $102\frac{1}{4}^{\circ}$ ; washed out. 6.30 P. M., P. 128, R. 28, T.  $99\frac{1}{2}^{\circ}$ . 9.30 P. M., P. 126, R. 26, T.  $100\frac{1}{3}^{\circ}$ . 12 M., P. 122, R. 20, T.  $100\frac{1}{2}^{\circ}$ ; washed out.

21st. 5 A. M., T.  $99^{\circ}$ . 6.45 A. M., P. 120, R. 22, T.  $101\frac{3}{4}^{\circ}$ ; washed out. 8.10 A. M., P. 100(?), R. 24, T.  $100^{\circ}$ . 12 M., P. 116(?), R. 22, T.  $101^{\circ}$ ; washed out. 3 P. M., P. 112(?), R. 26, T.  $102\frac{1}{2}^{\circ}$ . 5 P. M., washed out. 6 P. M., P. 110(?), R. 23, T.  $102\frac{1}{2}^{\circ}$ . 8 P. M., P. 130, T.  $101\frac{3}{5}^{\circ}$ . 9 P. M., P. 124, R. 28, T.  $103^{\circ}$ ; washed out.

22d. 2 A. M., P. 112, R. 24, T.  $101\frac{1}{2}^{\circ}$ ; washed out. 6 A. M., P. 112, R. 22, T.  $101\frac{1}{2}^{\circ}$ ; washed out. Since yesterday (Nov. 21st.) has had beef-steak three times a day, eggs, chicken broth, and  $\bar{3}$ ss spts. vini gallici t. i. d., milk *ad libitum*. 12 M., P. 123, R. 24, T.  $103^{\circ}$ ; washed out. 2 P. M., P. 110, R. 26, T.  $101^{\circ}$ . 3.30 P. M., P. 114, R. 24, T.  $101\frac{1}{2}^{\circ}$ . 4 P. M., washed out. 7 P. M., ord. enema by Dr. Thomas; three good stools. 9 P. M., P. 100, R. 22, T.  $100\frac{1}{2}^{\circ}$ . 12 M., P. 99, R. 26, T.  $100^{\circ}$ .

23d. 3.10 A. M., P. 97, R. 21, T.  $99\frac{3}{4}^{\circ}$ . 6.40 A. M., P. 110, R. 32, T.  $101\frac{1}{4}^{\circ}$ ; washed out. 9 A. M., P. 99, R. 24, T.  $98\frac{1}{2}^{\circ}$ . 12 M., P. 96, R. 26, T.  $99\frac{3}{4}^{\circ}$ . 3 P. M., P. 96, R. 22, T.  $100^{\circ}$ . 6.30 P. M., washed out. 8 P. M., P. 108, T.  $101\frac{1}{5}^{\circ}$ . 9 P. M., P. 104, R. 24, T.  $99\frac{3}{4}^{\circ}$ .

24th. 2 A. M., T.  $102^{\circ}$ ; washed out. 6 A. M., P. 110, R. 22, T.  $101\frac{1}{4}^{\circ}$ ; washed out. 9 A. M., P. 98, R. 20, T.  $100\frac{1}{2}^{\circ}$ . 12 M., P. 110, R. 24, T.  $102^{\circ}$ ; washed out. 3 P. M., P. 116, R. 30, T.  $101\frac{1}{2}^{\circ}$ ; 4.20 P. M., washed out. 6.10 P. M., P. 110, R. 24, T.  $100\frac{3}{4}^{\circ}$ . 9.15 P. M., P. 112, R. 26, T.  $100\frac{1}{2}^{\circ}$ . 12 M., P. 106, R. 22, T.  $101\frac{3}{4}^{\circ}$ ; washed out.

25th. 7 A. M., P. 114, R. 22, T.  $101^{\circ}$ ; washed out. 9 A. M., P. 110,

R. 24, T.  $99\frac{3}{4}^{\circ}$ . 12 M., P. 100, R. 24, T.  $101\frac{1}{2}^{\circ}$ ; washed out. 3 P. M., P. 103, R. 24, T.  $100^{\circ}$ . 6 P. M., P. 100, R. 24, T.  $101\frac{1}{2}^{\circ}$ ; washed out. 12 M., P. 104, R. 24, T.  $100\frac{3}{4}^{\circ}$ ; washed out.

26th. 6.30 A. M., P. 100, R. 24, T.  $100^{\circ}$ . 9 A. M., P. 100, R. 24, T.  $99\frac{3}{4}^{\circ}$ . 12 M., P. 96, R. 24, T.  $100\frac{1}{2}^{\circ}$ ; washed out. 3 P. M., P. 120, R. 24, T.  $99\frac{3}{4}^{\circ}$ . 6 P. M., P. 118, R. 24, T.  $101\frac{1}{2}^{\circ}$ ; washed out. 9 P. M., P. 100, R. 26, T.  $100\frac{1}{2}^{\circ}$ . 12 M., P. 109, R. 20, T.  $101\frac{1}{2}^{\circ}$ ; washed out.

27th. 3.30 A. M., P. 103, R. 22, T.  $99\frac{3}{4}^{\circ}$ . 6.49 A. M., P. 99, R. 19, T.  $99\frac{1}{2}^{\circ}$ ; washed out. 9 A. M., P. 104, R. 24, T.  $99\frac{3}{4}^{\circ}$ . 12 M., P. 112, R. 24, T.  $100\frac{1}{2}^{\circ}$ ; washed out. 3 P. M., P. 109, R. 24, T.  $100^{\circ}$ . 6.30 P. M., P. 107, R. 24, T.  $100\frac{3}{4}^{\circ}$ ; washed out. 9 P. M., P. 99, R. 24, T.  $100\frac{1}{2}^{\circ}$ . 12 M., T.  $101^{\circ}$ .

28th. 6 A. M., P. 92, R. 28, T.  $100^{\circ}$ ; washed out. 9 A. M., P. 100, R. 24, T.  $99\frac{3}{4}^{\circ}$ . 11.30 A. M., washed out; moved into chair. 12 M., P. 109, R. 22, T.  $100\frac{3}{4}^{\circ}$ . 3 P. M., P. 98, R. 22, T.  $101^{\circ}$ . 6 P. M., P. 96, T.  $100\frac{1}{2}^{\circ}$ ; washed out; cavity appears much smaller, as judged by the quick return of the injected fluid. 12 M., P. 99, R. 22, T.  $100^{\circ}$ .

29th. 6.10 A. M., P. 96, R. 20, T.  $99^{\circ}$ ; washed out. 10.45 A. M., washed out; sat up in chair. 12 M., P. 120, R. 24, T.  $101^{\circ}$ . 3 P. M., P. 108, R. 21, T.  $101^{\circ}$ . 3.30 P. M., washed out; a chunk of the placenta the size of a walnut was removed, very much decomposed and fetid. 6.30 P. M., P. 122, R. 24, T.  $102^{\circ}$ ; washed out. 9 P. M., P. 106, R. 26, T.  $101\frac{1}{2}^{\circ}$ .

30th. 12.20 A. M., P. 94, R. 20, T.  $101\frac{1}{2}^{\circ}$ ; washed out. 3.35 A. M., P. 99, R. 24, T.  $100^{\circ}$ . 6.45 A. M., P. 104, R. 22, T.  $99\frac{3}{4}^{\circ}$ ; washed out. 12 M., P. 112, R. 24, T.  $100\frac{1}{2}^{\circ}$ ; washed out. 3.30 P. M., P. 102, R. 20, T.  $100^{\circ}$ . 6.45 P. M., P. 112, R. 24, T.  $101^{\circ}$ ; washed out. 12 M., P. 100, R. 22, T.  $99\frac{1}{4}^{\circ}$ ; washed out.

Dec. 1st. 6 A. M., P. 99, R. 22, T.  $99\frac{1}{4}^{\circ}$ ; washed out. 12 M., P. 116, R. 24, T.  $101\frac{3}{4}^{\circ}$ ; washed out; patient has not been feeling so well for last two days; appetite not so good. 3 P. M., complains of pain in bowels; ordered hot poultice. 4 P. M., two diarrhoea stools. 6 P. M., P. 114, R. 24, T.  $101\frac{3}{4}^{\circ}$ ; washed out. 8 P. M., one diarrhoeal stool. 9 P. M., P. 124, R. 28, T.  $101\frac{3}{4}^{\circ}$ .

2d. 12.10 A. M., P. 114, R. 24, T.  $102^{\circ}$ ; washed out. 6.30 A. M., P. 112, R. 22, T.  $101\frac{3}{4}^{\circ}$ ; washed out; all food stopped but milk; brandy  $\frac{3}{4}$  t. i. d. as before. 12 M., P. 125, R. 24, T.  $102^{\circ}$ ; washed out; a piece of placenta walnut size was removed; the amount of discharge is small but very fetid. 3 P. M., P. 120, R. 24, T.  $103\frac{3}{4}^{\circ}$ . 6.30 P. M., P. 118, R. 24, T.  $101\frac{1}{2}^{\circ}$ ; washed out. 9 P. M., P. 112, R. 22, T.  $102^{\circ}$ . 12 M., P. 118, R. 24, T.  $103\frac{3}{4}^{\circ}$ ; washed out.

3d. 3.20 A. M., P. 120, R. 24, T.  $101\frac{1}{2}^{\circ}$ . 6.30 A. M., P. 110, R. 22, T.  $100^{\circ}$ ; washed out. 11.30 A. M., P. 104, R. 26, T.  $98\frac{1}{4}^{\circ}$ ; washed out. 6 P. M., P. 114, R. 24, T.  $100\frac{1}{2}^{\circ}$ ; washed out. 9 P. M., P. 110, R. 24, T.  $100\frac{3}{4}^{\circ}$ . 12 M., P. 110, R. 24, T.  $101^{\circ}$ ; washed out.

4th. 6.45 A. M., P. 108, R. 22, T.  $99\frac{1}{2}^{\circ}$ ; washed out. 12 M., P. 105, R. 25, T.  $99\frac{1}{2}^{\circ}$ ; washed out; patient resumed ordinary diet. 6 P. M., P. 116, R. 24, T.  $101\frac{3}{4}^{\circ}$ ; washed out. 12 M., P. 104, R. 20, T.  $100^{\circ}$ ; washed out.

5th. 7 A. M., P. 106, R. 20, T.  $99\frac{3}{4}^{\circ}$ ; washed out. 12 M., P. 104, R. 20, T.  $100^{\circ}$ ; washed out. 6 P. M., P. 100, R. 20, T.  $100\frac{1}{2}^{\circ}$ ; washed out. 12 M., P. 100, R. 20, T.  $99\frac{3}{4}^{\circ}$ ; washed out.

6th. 6 A. M., P. 104, R. 22, T.  $99\frac{3}{4}^{\circ}$ ; washed out. 12 M., P. 99, R.

20, T.  $100^{\circ}$ ; washed out. 6.30 P. M., P. 99, R. 20, T.  $100\frac{1}{2}^{\circ}$ ; washed out. 12 M., P. 96, R. 22, T.  $99\frac{1}{2}^{\circ}$ ; washed out.

7th. 7.30 A. M., P. 102, R. 24, T.  $99\frac{3}{4}^{\circ}$ ; washed out. 12.30 P. M., P. 88, R. 20, T.  $100^{\circ}$ ; washed out; a small portion of the placenta removed; walked across room with assistance; sat up in chair entire afternoon. 6.35 P. M., P. 118, R. 24, T.  $100^{\circ}$ ; washed out; patient is not to be washed out at 12 M. any more, because morning temperature for last three days has been below  $99^{\circ}$  (corrected temperature) and discharge hardly fetid although puriform.

8th. 7 A. M., P. 100, R. 20, T.  $100^{\circ}$ ; washed out. 12 M., P. 108, R. 22, T.  $99\frac{3}{4}^{\circ}$ ; washed out; sitting up in chair; walks about without assistance. 6.30 P. M., P. 110, R. 24, T.  $100\frac{1}{4}^{\circ}$ ; washed out.

9th. 7.30 A. M., P. 100, R. 20, T.  $100^{\circ}$ ; washed out. 12 M., P. 100, R. 20, T.  $100^{\circ}$ ; washed out. 7 P. M., P. 100, R. 19, T.  $99^{\circ}$ ; washed out.

10th. 9 A. M., P. 89, R. 18, T.  $99\frac{1}{2}^{\circ}$ ; washed out. 12 M., P. 100, R. 24, T.  $99\frac{3}{4}^{\circ}$ ; washed out. 8 P. M., P. 99, R. 21, T.  $100^{\circ}$ ; washed out.

11th. 8 A. M., P. 92, R. 20, T.  $99^{\circ}$ ; washed out.

Patient to have cavity washed out only morning and evening. The index finger was introduced into the cavity and the remaining portion of the placenta felt very hard and dense. The return fluid is not fetid, and only very slightly puriform. The opening is closing rapidly, so that there is just room sufficient for the water to escape alongside of the catheter (No. 10). Put on house diet.

18th. Patient goes about the ward and assists the nurse. Washed out morning and evening.

25th. Patient to go home, being capable of washing out the cavity herself daily. Placenta still remains attached to abdominal walls. Patient to see her physician occasionally."

This is rather a lengthy and tedious detail of the progress of this case, and yet I offer no apology for its introduction. It appears to me that its value as an illustration of the great importance of antiseptic injections in such cases, and as a demonstration of what can be accomplished by faithful attention, removes the necessity of so doing.

CASE V. *Abdominal Pregnancy of twenty-two months' standing; Fætus delivered by Laparotomy, with Recovery of Mother.*—As this case has been fully reported by Dr. E. Frank Coates, of Mystic Bridge, Ct., in whose practice it occurred, I extract his report from the *Proceedings of the Connecticut Med. Society*, for 1878, and give it entire:—

"I was first called to Mrs. J. W. M., aged 21 years and 6 months, an American by birth, and above medium size, April 30th, 1875. I found her pregnant for the first time, with general anasarca, indisposed to exercise much, and feared puerperal eclampsia. With appropriate treatment she went to full term, and May 21st I delivered her with the forceps, under chloroform, of a still-born child, after a labour of about twenty-four hours' duration. It was living a short time before its birth. Septicæmia followed. She had pelvic abscess, abscess in the thigh, and did not get well over the effects of the blood-poisoning for more than three months. After dismissing my patient in September, I was not called to her again until February, 1877, when her husband informed me that she was again pregnant, expecting to be confined about April 20th to 25th, and though she felt well, and very different from her former gestation, he wished me to call in some

time when I was passing, and it was convenient. I found her apparently well; functions normal; countenance good, cheerful, and doing the work for four in the family, and happy in it.

*April 4.* I was called, and found she had pains that came on the latter part of the previous night, resembling labour pains; made a hurried examination, pronounced the pains spurious, and gave an opiate, which soon quieted her, but she was exhausted beyond what is a common consequence of such pains, and was able to lie only on the right side. The evening of the 5th she vomited large quantities of bilious matter; the next day a bilious diarrhœa set in, which was checked with opium. I then gave a large dose of calomel, followed by castor oil. After this she vomited once every morning for some time, but the diarrhœa was easily controlled.

The discharges were of a clayey colour, for which I gave several blue pills, without any visible benefit. The urine, during all of this time, was normal in quality and quantity. She could lie only on the right side, except for twenty minutes at a time; she would sometimes be turned upon the left, but could not lie on the back. She was restless, requiring a small opiate once every night, and sometimes oftener, to keep her comfortable.

She did not have any more uterine pains, and after waiting about three weeks—the time of her expected confinement—I made another digital examination, finding the uterus high up as before, the os not dilated, neck not shortened, the head not presenting at the brim of the pelvis. The whole fœtus was on the right side, and so high that no part could be felt with the examining fingers from within the vagina. I had no sound with me, and desisted from further investigation, but had learned enough to inform her husband and mother of my fears.

*May 5.* She commenced to have a show—shedding the uterine mucosa—which continued without pain from day to day for some time. Her husband, getting extremely anxious, requested his old family physician from Rhode Island to see her. The consultation was held May 21st, when I had the patient etherized, so that she could be laid on her back, and introduced the sound three inches within the womb, and could feel nothing but its walls. The uterus had a slight left lateral displacement, and was somewhat flexed to the right. The fœtus was dead, lying on the right of the median line, between the floating ribs and ileum, but the whole abdomen was distended. My counsellor had seen nothing of the kind; he evidently knew but little about it, but agreed with me in everything.

*June 27.* The show continues, and to-day she had a fall upon her knees, which caused some metrorrhagia, which was soon followed by a dirty, sanious, watery discharge. Afterward she was so constipated that the whole rectum became impacted with feces, so as to require large injections of soap and water, often repeated, and their removal caused great pain. I see the patient once a week. She is weak, emaciated, and the show continues—which, it will be remembered, commenced May 5th—with occasional passages of a dirty brown, sanious water, and, it is thought, there is more of this discharge when she lies on the left side, which she cannot do except only for a short time; but her countenance has improved. She looks brighter, is more cheerful, can eat somewhat better, but milk is her chief support. She sleeps well, but requires opium in some form to keep her easy.

*July 18.* There has not been so much show or watery discharge for the last week. The abdomen is greatly distended, and has been for several weeks. This night a watery, dirty discharge commenced anew, with vomiting, and pain in the back, somewhat severe. The night of the 19th she saturated everything that was laid under her, even to the mattress, and the discharge continues more or less profuse for six days without loss of the patient's strength.

The 25th I find the abdominal enlargement very much lessened, and can feel the outlines of the fœtus. Is this the liquor amnii? and is it discharged through the right Fallopian tube?

The 30th I am called, and find loss of appetite, with occasional severe spasmodic pains in the back, but not much sanious discharge for the last two days.

31st. Patient is more comfortable; has had no severe pains since last seen. The watery discharge commenced again last night; this forenoon it has been quite abundant, and for the first time somewhat offensive.

*August 1.* I met Dr. C. M. Carleton in consultation, who agrees with me in the course pursued, and also that, unless the condition of the patient could be improved, gastrotomy would result in death.

*6th.* Has had very little show for about three weeks, no severe pain since last seen; the same discharge continues. She is getting smaller, her appetite is better but not good, and she has sat up three hours in a day. The 10th she is not as well; appetite very poor, but no severe pain. The night of the 14th had severe pain in the stomach which lasted until morning, and greatly prostrated her; the same discharge continues.

*22d.* No pain, not as much discharge and this has changed; a membranous, meaty discharge is mingled with it.

*29th.* Quite comfortable; better appetite; some pain, but not severe; discharge muddy-looking but not so membranous.

*September 5.* The shreddy, muddy discharge continues, general health improved.

*12th.* The discharge continues muddy and pulpy, and yesterday it was judged that a teacupful of settlings was discharged, and a finger-nail was found on the cloth she wore. She is in good spirits and thinks she will get well. From the 19th to October 8th she is quite comfortable and seems to improve in appetite and countenance. There is less of the meaty discharge. She has sat up two hours and more at a time, and walked into the kitchen.

*October 16.* She has not been as well for several days; there is more discharge and thicker, like decayed chopped meat. Countenance has a hectic flush, pulse frequent and irregular; bowels in good condition and have been for a long time; smell of discharge at times quite offensive.

*22d.* Not much change, but she has discharged two semi-putrid meaty pieces larger than butternuts.

*29th.* Discharge about the same in quantity but less meaty and less offensive. She was 24 years old yesterday.

*November 7.* More pain, appetite fair, bowels loose but not a diarrhœa. She has discharged two bones of a finger.

*23d.* Sleeps well, appetite poor, pulse weak, not much pain, hectic flush on cheek. Has discharged what appear to be pieces of tendon, and one phalangeal and one metacarpal bone, not so much other discharge.

*30th.* About the same, pulse very feeble, and more discharge, which is sometimes tinged with blood.

*December 7.* She is more restless at nights, has neuralgic pains in different parts of the body, and is getting smaller.

*13th.* Appetite improved; sleeps better; bowels regular; hectic flush nearly gone; discharge continues.

*February 28.* Continues to improve; rode out yesterday without hurting her; has the discharge when she lies down, but not while sitting; it is somewhat bloody to-day. There is considerable thickening of the subcutaneous cellular tissue in the lower right hypogastrium where the fœtus was at the first most prominent. She does all her walking in a stooping posture, assisted by a cane or some support, as from the first.

*March 21.* The discharge continues while lying, but is not tinged with blood. It has been of a greenish colour, and more offensive within a few days. Occasionally there is some discharge from the centre of the umbilicus, and has been for the last two months; it has increased of late and appears in look and smell like that from the vagina. It probably comes from the sac that surrounds the fœtal bones. She appears as well as when last seen three weeks ago, but has not improved. She is very sore, and cannot bear pressure over the sac, especially on the left side. She has improved in flesh. When at the greatest emaciation a garter of 6½ inches was worn below the knee to hold the stocking; now 9½ inches is required for the same purpose. I have advised gastrotomy as soon as she can willingly consent to it. Her general health is good.

*April 14.* I have been preparing the patient, trying to get her full and free consent to an operation, and finally succeeded. Believing that she will have better care at the New York State Woman's Hospital than her circumstances will

allow at home, I have made arrangements to have her taken to that institution; and Dr. T. Gaillard Thomas is engaged to operate.

30th. Arrived at the hospital at 9½ o'clock, A.M. Considerably fatigued, but in good spirits, and has borne the journey very well. At 3½ P.M. met Dr. For-dyce Barker and Dr. Thomas in counsel, who agreed with me that gastrotomy should be performed as soon as the patient could be rested and the bowels cleared, so as to get ready for it.

May 3. The patient is placed on the table and etherized. At 8 o'clock the abdominal cavity was opened; and a sac adherent to the walls and in front of the intestines found; which contained but little else except the bones; and as these were turned out Dr. Thomas said to me, 'I find everything as you predicted.' The sac was entire, but in removing the bones, which had become separated and imbedded in its walls, it was torn so as to allow some of its filthy contents to escape into the peritoneal cavity, thus greatly endangering peritonitis and septicæmia. The posterior portion of the sac was then slit open, so as to allow free drainage. The cavity was sponged, a drainage-tube inserted, and the external wound closed around the tube by silver-wire sutures. She was then placed in bed, a hypodermic injection of morphia given, and soon recovered from the ether, and shock of the operation; but all who witnessed it believed her chances for complete recovery were very small. The next day I received a telegram from the House Surgeon, saying, she is 'doing first-rate.'

5th. Dr. Barker informs me that the patient appears 'quite bright and cheerful. Her temperature was only 99°; pulse 110. No tympanites, no peritonitis; and it is rather late to expect a development of septicæmia, and if severe renal complication does not exist, she has a pretty fair chance of recovery.

6th. The temperature has not risen to 100°, but the pulse has averaged 130-136. She has vomited a good deal of a dark-green fluid for the last two days. The abdomen is slightly tender, and it is thought she has peritonitis. The abdominal cavity is washed out daily through the glass drainage-tube.'

10th. She is doing well; has much less vomiting; pulse and temperature both lower, pulse 120, temperature 98½°.

11th. 'Dr. Thomas regards her as out of danger.'

15th. The House Surgeon informs me that 'the drainage-tube has been taken out and the discharge is very slight, although fetid. The average temperature is 99½°. She does not vomit. Her general appearance is excellent. She has overturned all our theories, and done better than we had any idea of.' "

This case entirely recovered, and the patient left the hospital perfectly restored to health. I can recall no instance in which I have performed any capital operation upon a patient so depreciated in constitutional condition. The operation was undertaken as a "forlorn hope," and with a decided conviction on my part that it would fail to save life. It was one of those unfortunate instances in which one operates merely from a strict sense of duty. Although the case ended favourably I feel that out of nearly one hundred and fifty laparotomy operations which have fallen to my lot it was less skilfully and cautiously performed than any other. The patient recovered without the development of a bad symptom, but she recovered in spite of certain untoward occurrences which I could have and should have avoided. Instead of rapidly evacuating the extra-uterine sac of its contents, and in the removal of bones firmly attached to the cyst wall tearing through so as to open a communication with the peritoneal cavity, I should have slowly and cautiously removed the mass of bones, and then, leaving the abdominal wound open for the gradual discharge of others which were attached, kept up antiseptic injections until the foetal shell had entirely contracted and extruded its contents through the wound.



CASE VI. *Abdominal Pregnancy now advanced to four months and one week: Still in Progress and kept under observation.*—This case I am now attending with Dr. Wilhelm Frankl, and I will give the history in his words, as he has very kindly written it out and put it at my disposal.

“Mrs. T., aged 30 years, born in Austria, married since 3d February, 1869, was delivered 14th October, 1869, of her first and only child, a healthy girl, now nine years old, without professional assistance. Her menstruation was always regular, lasting three days, not very profuse, until 1875, when she was taken ill with metrorrhagic and abdominal pains, and confined to bed from the end of November to the middle of March, 1876. Since this time she was again well and regular, until 29th of this July, when she had only a show of blood for one day. In the middle of August she lost some blood, felt a little uncomfortable, had vomiting at different times, and her breasts were swollen, so that she believed herself to be pregnant. In the beginning of September she was taken ill with pain in the bowels, and with metrorrhagia, the blood containing at the end of September well formed membranes. After several weeks treatment by a quack with hot water injections, I was called in on the 17th of October.

“I found the patient in bed, very weak, suffering from abdominal pains extending to the back and limbs, pale through loss of blood; pulse feeble, over 100, temperature  $101^{\circ}$  in rectum. The cervix uteri was behind the symphysis ossium pubis, corpus uteri, slightly enlarged, easily felt through the abdominal walls above the os pubis. Passing my fingers into the vagina, I felt in the back wall more to the left, a swelling, increasing towards the fornix vaginae, behind the cervix forming a tumour, round, not tender, but dense. This tumour could be felt by bimanual manipulation in the right iliac region. On macroscopical and microscopical examination, I found the expelled membranes to be ‘deciduae.’

“These facts, with the given symptoms of common pregnancy, and the statement of the patient that she feels the rolling of something in her abdomen when she moves from one side to the other, induced me to exclude all other possibilities and to make the diagnosis extra-uterine, and especially abdominal, pregnancy.”

It will be seen that before I saw this case Dr. Frankl had made the diagnosis. Upon a very careful examination, I was led to agree with him by the following rational and physical signs: first, the existence of all the ordinary signs of pregnancy with irregular sanguineous discharge; second, the existence of a painful tumour behind the uterus; third, the expulsion of decidual membranes without abortion; and fourth, the displacement upwards and forwards of the uterus by a tumour which, by exclusion, could be proved not to be a hæmatocele, an ovarian cyst, or a fibroid.

It is quite true that the diagnosis may not prove to be correct; but a diagnosis being merely a logical deduction from given premises, I believe this to be the most logical which can be maintained under the circumstances.

The diagnosis, prognosis, and proposed plan of treatment were, by Dr. Frankl and myself, clearly laid before the lady’s husband, and he cheerfully accepted the alternative of waiting, in the hope that, at a later period,

when nature has pointed out the channel which she would prefer for extrusion of the foetal mass, operative interference would be far safer than at present. The hope was likewise held out to him that at the end of the ninth month of extra-uterine gestation the crowning triumph of obstetric surgery might be gained by saving the lives of both mother and child, as was done in the case recently reported by Mr. Jesop, of Leeds, to the London Obstetrical Society. At the same time, the fact was made quite clear to him that delay might result in the sudden rupture of the foetal sac and the immediate death of his wife. The dangers of delay were balanced against those of immediate operation, and he readily consented of two extreme dangers to choose the lesser.

I have operated six times for extra-uterine pregnancy, but never have I done so without good reason for believing that delay would be far more dangerous than immediate interference. Out of the six operations, four have saved lives which were in imminent peril. My experience makes me willing to accept as a rule the precept that operative procedure in extra-uterine pregnancy had better, if possible, be delayed until nature points to the channel of extrusion which she selects. The most dangerous of men, however, are those who implicitly, unthinkingly, obey rules. The bold and wise surgeon is he who keeps the rule for general guidance, breaking it unhesitatingly when an exceptional indication demands such a course. I must confess, too, that I regard the basis upon which rest the rules of practice with reference to this whole subject as unreliable and requiring complete and careful reconsideration. The usual starting-point for the discussion is Campbell's monograph, a contribution which, although excellent for its day, is now almost as completely obsolete a guide for practice as the dicta of Blundell and Ramsbotham would be upon ovariectomy. I have given in my adherence to the orthodox creed in these cases, but if this poor lady be not cut untimely off by rupture of the foetal shell, I shall watch with eager eyes for some valid indication to make an exception to an unfortunate rule by which her life, and perhaps that of her offspring, may be snatched from an impending fate.

There is in this interesting case one feature from which I take great encouragement, and which I have not yet specially mentioned. The post-uterine tumour evidently tends to burrow downwards, forcing the fluid which it contains into a pouch between the vagina and rectum, below the uterus, by pushing downwards the pouch of Douglas. This tendency makes me hopeful that in case interference becomes imperative before full term it may be practised with diminished risk at this point; while, should the full term arrive and the head of the child, pushing aside the uterus, present here, I may be able to cut through the vaginal wall, seize the head by the obstetric forceps, and deliver a living child from a woman only slightly endangered by the operation almost *per vias naturales*.

In the year 1816, Dr. John King, a country practitioner, residing upon

Edisto Island, on the Coast of South Carolina, met with just such a case as I have described, and being both a bold and original man, one who recognized the importance of exceptions to rules, he followed the course to which I have alluded with the result of saving mother and child. This case will be found published in the *Med. Repository*, 1817, and a pamphlet upon the subject by Dr. King is now in possession of Dr. Pooley, of Yonkers, N. Y.

In my last case the great danger is that an error of diagnosis may have been made as to the variety of extra-uterine pregnancy which exists, and that this error may be suddenly announced by rupture of the sac and fatal collapse on the part of the patient. But even if such an error was now known to exist, I would not, under present circumstances, feel warranted in accepting the grave dangers of immediate operation. In such a case, he who strives to act conscientiously for the true interests of his patient, must be guided merely by the best light which is afforded him at the moment when decision is called for. In this case I feel that the course which is being pursued is that which is dictated by sound judgment.

Were these cases published simply as "six cases of extra-uterine pregnancy," the report would be calculated greatly to mislead in reference to the mortality of this terrible aberration of gestation. Here are six reports of unquestionable and carefully observed instances of this condition with not one death! Surely it might from this be said extra-uterine pregnancy, managed by the means at the disposal of modern surgery, is to a great extent bereft of its old-time dangers! But these cases are not so published, and although I have already endeavoured to avoid the creation by them of any erroneous impression, I still further effect that object by stating the mortality of the remaining nine cases of extra-uterine gestation with which I have met.

Of two cases of interstitial pregnancy one died, and one recovered after a dangerous interference which saved her life. Of seven tubal pregnancies six died, and that which survived did so only after submitting to a capital operation in itself sufficient to have destroyed life, but which in this case fortunately saved it.

It will thus be seen that the results here published bear me out in the statement made in the commencement of this paper that abdominal pregnancy, although attended by great dangers, is far less hazardous than any of the other varieties of this class.

The question now arises as to the time at which surgical interference should be practised in such cases. In the other varieties of extra-uterine pregnancy, the continued progress of gestation exposes the woman to constant and steadily increasing danger of sudden death. In the abdominal form it not only does not do this, but it is often the wise course to allow the process to continue until the child arrives at full development, as has been done in repeated cases, and as I am now doing in Case VI.

But let us suppose that either before or after full term of gestation the child has died, and it is pretty certain that the woman carries her dead offspring within the peritoneal cavity. Is it wise on this account at once to interfere by surgical means? I think not. One of the greatest dangers attaching to interference consists in hemorrhage. The longer time that the placenta remains attached after foetal death the more certain it is to become atrophied, and consequently less vascular. Another great danger consists in septicæmia. The more thoroughly the foetal envelopes become disorged and atrophic from loss of function, the less likely is this dangerous complication to develop. Judicious delay and cautious waiting for symptoms indicative of approaching trouble are then, in my opinion, decidedly advisable.

But such delay, such waiting, are by no means to be carried as far as in Cases V. and III., where the symptoms of septic absorption had gone in one case to marked constitutional depreciation, and in the other to production of a condition which almost precluded the possibility of recovery. Non-interference carried as far as this is not less to be deprecated than a rashness which results in intemperate and premature resort to operation.

No fixed rule can apply to all these cases. The following may guide the practitioner in general, he modifying them to suit the varying indications which may present themselves:—

1st. Before full term, should the child developing in the peritoneal cavity be alive, its growth may be carefully watched, and the end of the ninth month be waited for in the hope of delivering at that time either by laparotomy or elytrotomy a living child from a living woman.

2d. Should the child have died early in pregnancy, delay in interference is advisable, but this should not be carried to the production of septicæmia or hectic.

3d. Should the full term be passed, and the child be still imprisoned in its unnatural resting-place, the rule should be to wait for evidences of constitutional disorder on the one hand, and to meet its development promptly and decisively by succour on the other.

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## ARTICLE II.

ON THE ELASTIC BANDAGE IN THE TREATMENT OF ANEURISM, WITH A CASE OF FEMORAL ANEURISM, CURED BY THIS MEANS. By ROBERT F. WEIR, M.D., Surgeon to the New York and Roosevelt Hospitals.

It is only within a comparatively recent period that the idea of rapidly coagulating the blood contained in an aneurism has been carried into effect. This was done, as is well known, by Murray in 1864, who attracted attention to the method by his remarkable success in curing an abdominal aneurism by four hours' consecutive pressure on the aorta above the tumour.

## Successful Cases.

No.	Surgeon.	Aneurism.	Duration of elastic compression.	Method of bandaging resorted to.	Subsequent compression.	Effect of compression on limb.	Result.	Remarks.	Where reported.
1	Roid, Plymouth.	Popliteal, traumatic.	60 minutes.	Up to, lightly over and above aneurism; after tubing put on bandage taken off.	Carte's compressor kept on with intermittent pressure until evening of next day. Complete compression continued by tourniquet for 6 h. 35 sec.	Temp'y numbness of the toes, and some lachrimating pain on ext. part of leg. Leg slightly swollen.	Cured.	The pulsation had stopped when the tubing was taken off. No pulsation in artery below point where tubing was applied. (No anæsthetic.) Lancet, Aug. 5, '76.	Lanc. Sept. 23, 1875, for post-mortem appearances see Lancet, Aug. 5, '76.
2	Wagstaff, London.	Popliteal, traumatic.	55 minutes.	Up to, lightly over and above; tubing not used.	Complete compression continued by tourniquet for 6 h. 35 sec.	Toes blue and cold.	Cured.	Pulsation stopped in two hours. (No anæsthetic.) P. mort. ap. see M. T. & G. Nov. 10, '77.	Lancet, Nov. 4, 1876.
3	Heath, Manchester.	Popliteal, idiopathic.	60 minutes.	Up to, lightly over and above aneurism; tubing not stated; erect position used.	One hour complete and four hours incomplete compression resorted to.		Cured.	Pulsation had nearly ceased when tubing was removed, but did not stop until 13½ h. after. Recurred a little same eve. Shot-bag was then kept on for 4 days, when all pulsation had gone. (No anæsthetic.)	Lancet, Feb. 3, 1877.
4	Wright, London.	Femoral in Hunter's canal, traumatic.	2½ hours.	Up to, lightly over and above aneurism; erect position not used; tubing employed.	Shot-bag kept on for 13½ hours.	Whole limb, when bandage was removed, was dusky and cold.	Cured.	The tumour was found solid when the tourniquet was removed. (No anæsthetic.)	Lancet, May 26, 1877.
5	T. Smith, London.	Popliteal, idiopathic.	63 minutes.	Up to, not over and above aneurism; tubing used.	Complete by tourniquet for two hours.	Not stated.	Cured.	Slight pulsation was detected when Es-march's bandage was removed. (No anæsthetic.)	Lancet, June 30, 1877.
6	Tyrrell, Dublin.	Popliteal, idiopathic.	70 minutes.	Up to, lightly over and above aneurism; tubing used.	Digital compression resorted to for 2 h. afterwards, and as a precaution a moderately tight tourniquet for some hours after that.	Numbness of the toes and foot, which disappeared in 24 hours.	Cured.	Pulsation had ceased when the Es-march bandage was removed. (No anæsthetic.)	Lancet, Feb. 16, 1878.
7	Groft, London.	Popliteal, idiopathic.	60 minutes.	Up to, not over and above aneurism; tubing used, also erect position.	Digital compression for six hours.	Echymosis about knee for ten days.	Cured.	Pulsation felt in tumour when bandage taken off; stopped in six hours. (No anæsthetic.)	Lancet, Jan. 19, 1878.
8	Cornish.	Anterior, tibial, traumatic.	60 minutes.	Up to and above aneurism; put in erect position; tubing used.	Tourniquet, with complete compression for 2 hours and 10 min.	Ordinary symptoms.	Cured.	Pulsation had ceased when the Es-march bandage was removed. (No anæsthetic.)	Lancet, Feb. 16, 1878.
9	Mansfield, Liverpool.	Popliteal, idiopathic.	2 trials, 45 min. each two days apart.	Up to, lightly over and above aneurism; tubing used.	After 1st trial tourniquet lightly applied for 4 h.; after 2d trial flexion resorted to; tumour became firmer; flexion continued to 8th day.	No mention made.	Cured.	The first trial produced a solid feeling in the aneurism, and the benefit was thought to be more due to the first trial than to the second one. (Anæsthetic used.)	Lancet, Jan. 19, 1878.
10	Syd. Jones, London.	Popliteal, idiopathic.	2 trials, 1st, 65 minutes, 2d on 4th day for 40 minutes.	Up to, not over and above aneurism; tubing not employed.	Instrumental and digital press. after 1st trial, respectively 2 h. 15 m. and 4 h. 15 m. After 2d trial digital compression for 4 h. 51 m.	No mention made of condition of limb.	Cured.	Pulsation felt as soon as Es-march bandage was removed. After compression 6½ h., pulsation ceased to recur 2 days later, though aneurism was much harder. Tumour harder and pulseless; after 2d trial no recurrence; in 2d trial bandage carried higher in groin. (No anæsthetic.)	Brit. Med. Journ., Oct. 20, 1877.
11	O. Bloch, Copenhagen.	Popliteal, idiopathic.	60 minutes.	Up to, lightly over and above aneurism; tubing used.	Carte's compressor for 1 hour, then digital compression for 5½ h.	Toes cold and blue, but rapidly recovered when bandage was removed. Some paralysis of foot for a few days.	Cured.	When bandage taken off tumour hard but not pulseless. Pulsation disappeared under the digital pressure.	Hospit Tidende, 2 R. iv., 51 & 51.

No.	Surgeon.	Aneurism.	Duration of application of elastic compressor.	Method of bandaging resorted to.	Subsequent compression.	Effect of the compression on the limb.	Result	Remarks.	Reference.
1	Bradley, Manchester.	Popliteal, idiopathic.	2 trials; 1st, 50 min.; 2d, 1 w'k later, 65 min. 50 minutes.	Up to and above aneurism, which was left exposed.	None.	.....	Failure	Pulsation recurred almost immediately after bandage was removed. Ligature afterwards resorted to.	Br. Med. Journ., Oct. 26, 1876.
2	T. Smith, London.	Popliteal, idiopathic, and femoral, traumatic on same side.		Aneurism nearly emptied by pressure of bandage carried up to over and above.	None.	.....	Failure	Was not sure that circulation was completely arrested by bandage as sac was covered over. Femoral artery was ligated <i>below</i> upper aneurism. (No anæsthetic.)	Lancet, May 26, 1877; Dec. 1, 1877.
3	Fleming, Netley Hosp.	Femoral (high up), traumatic.	2 trials, 1 hour and 50 minutes respectively.	Bandage applied "in manner recommended." Reid's compressor applied to external iliac.	None.	.....	Failure	Though tumour felt harder and pulsation appeared less, yet there was no permanent good result, and external iliac was ligated. (Anæsthetic.)	Br. Med. Journ., Oct. 1, 1877.
4	C. Heath, London.	Popliteal, idiopathic.	4½ hours.	Up to, not over and above aneurism; placed erect; tubing used.	None.	.....	Failure	Carte's compressor for 102½ hrs. and flexion for 65 hrs. had previously been used. After failure with Esmarch's bandage ligature was used, pulsation recurred after 19 hours, then ceased for 14 days, and on recurring again the femoral was ligated a second time with a hempen ligature, the first having been of catgut. The aneurism was supposed to be a tubular one. (Anæsthetic.)	Lancet, Dec. 1, 1877.
5	Campbell, Liverpool.	Popliteal, idiopathic.	3 trials of 50 min. each, at intervals of some days.	Up to, slightly over and above aneurism; tubing used.	"A tourniquet was kept on some time afterwards."	.....	Failure	Femoral ligated. Galvano-puncture untised.	Lancet, Jan. 19, 1878.
6	Barwell, London.	Popliteal, idiopathic.	2 trials: 1st of 70 minutes; 2d, for 5 hours.	Esmarch's elastic bandage applied from toes up the thigh, compressing strongly the aneurism.	None.	.....	Failure	Fusiform aneurism in a patient very much run down by albuminuria, hæmoptysis and syphilis. From history it seems that the tumour returned immediately after the withdrawal of the bandage, and was unaltered in character. (Anæsthetic not stated.)	Lancet, Jan. 26, 1876.
7	Pago, London.	Popliteal, idiopathic.	3 trial; 1st, 90 minutes; 2d & 3d, 1 hour each.	Up to and above but not over aneurism; tubing used; sac filled by hanging leg downwards.	Tourniquet placed on limb to control but not to arrest the circulation, and kept on till next day; this was repeated each time.	Edematous which lasted two days, and ecchymosis about heel and knee after 3d trial.	Failure	By the bandage a considerable hardening of the aneurism was produced each time except the last, tumor then increased in size with more violent pulsation. Femoral ligated. (Anæsthetic.)	Lancet, March 23, 1878.
8	Lano, London.	Popliteal, traumatic.	60 minutes.	"Applied in the usual manner."	Digital comp. 1 hour and a "tourniquet" applied.	.....	Failure	Pulsation less when Esmarch's bandage removed, but returned in full force that evening. (Anæsthetic.)	Lancet, May 11, 1878.
9	Markoe, New York.	Popliteal, idiopathic.	2 hours.	Up to, over and above aneurism.	None.	.....	Failure	Pulsation returned on removal of the elastic bandage. Femoral ligated.	Unpub. Records Roosevelt Hospital.

His example was speedily followed by Mapother, of Dublin, who successfully treated an ilio-femoral aneurism by totally arresting the blood-current by pressure, continued for four and a half hours, which was not only applied above the tumor to the common iliac, but also, as suggested by O'Ferrall, below it, upon the femoral artery, in order to keep the sac full of blood. Other cases have from time to time been reported in the journals, but considerable difficulty has, until a short time since, been experienced in the means resorted to in bringing about the occlusion of the artery between the aneurism and the heart. Mechanical contrivances worked, as a rule, unsatisfactorily, and digital compression, though more effectual, was not always easy to command. The accomplishment of the end desired was really one of the indirect benefits derived from the bloodless method, presented to the profession by the distinguished Esmarch, and was effected by Staff Surgeon Walter Reid, who in 1875 published (*Lancet*, Sept. 25) an account of a case of popliteal aneurism which had been cured by him in fifty minutes by the application of Esmarch's elastic bandage. This success was also obtained in a number of instances by various surgeons who had read or heard of this rapid method of curing so serious an affection. Up to the present time I have been able to find recorded some twenty cases of aneurism wherein this method has been tried, a summary of which is to be seen in the accompanying tables (pp. 34 and 35.)

To this list I beg to add the following case, which has lately occurred under my own observation :—

*Traumatic Femoral Aneurism Cured by ninety-three minutes' Compression by the Elastic Bandage (Reid's Method).*—Capt. O. H., of the U. S. A., aged 45, was admitted into the New York Hospital August 26, 1878, with the following history : In March of the present year, while exercising with his company (cavalry) at Fort Bayard, N. T., his horse stumbled and so nearly threw him that his left foot was disengaged from the stirrup, and his right thigh severely jammed against the pommel of the saddle. A few days later, attracted by the continued pain in the limb, the post surgeon discovered, at the apex of Scarpa's triangle, the presence of an aneurism the size of a hen's egg. Twelve days afterwards, March 24, digital compression at the groin was resorted to by relays of soldiers, which was continued to April 6, the pressure being made at first one hour and twenty minutes per diem, and gradually increased to six hours a day, but no good result ensued. On the 10th, 11th, and 12th of April Esmarch's elastic bandage, without the tubing, was applied up to, over, and above the tumour for one hour each day, without any anæsthetic being employed, and, although the tumour hardened somewhat under this treatment, the patient, who was naturally a very nervous man, became so excitable that all treatment of the aneurism was abandoned until the 10th and 11th of May, when the elastic bandage was again applied in a similar manner, for forty minutes each time, without, as before, any subsequent compression of the artery being made after the elastic bandage was removed. Digital compression was then resumed for six hours daily, from May 13 to July 12, supplemented the greater portion of the time by the use of instrumental pressure (Briddon's artery compressor), for one hour each

day. During all these trials the patient steadily refused the use of an anæsthetic, and it is only just to Dr. R. E. Smith, U. S. A., the post surgeon, to quote from his statement that, "had I been privileged to use ether, there were times in the treatment when I thought by this means I would have cured the tumour." When the patient left to come to New York the aneurism was decidedly harder, but during the journey it rapidly increased in size, and, when he entered the hospital, it measured some six inches both vertically and transversely, and the limb in circumference two inches more than its fellow. The tumour began six inches from Poupart's ligament, and was easily compressed, its wall was thin and it pulsated strongly with a harsh loud bruit, heard most distinctly at its proximal end. The general condition of the patient was of considerable nervous depression and anxiety, but examination revealed no organic lesion of the kidney, heart, or lungs, and the sphygmograph showed equality in both radials.

On reviewing the history it was felt that owing mainly to the fears of the patient, the method of elastic compression had not been fully tested in his case, and on this being explained to him, he consented to another trial with the aid of ether. On August 29th the attempt was made by first covering the limb smoothly with a flannel bandage from the toes to the groin, leaving the aneurism, however, exposed; then, at 3.50 P. M., an elastic bandage was firmly applied from the toes up to just below the tumour. The patient was then stood up in order to have the aneurismal sac fully distended, and while in the erect position a second elastic bandage was applied from just above the tumour to the groin, and secured by three turns of half-inch india-rubber tubing, at a point just below the origin of the profunda femoris. The recumbent position was then resumed. It was observed, in corroboration of his statement relative to the previous trials, that the elastic bandage alone, though tightly drawn, did not entirely control the pulsation in the aneurism. This only ceased when the tubing was applied. The patient bore the compression very well for the first half hour, but, finding by that time that the aching pain, felt mostly at the site of the tubing, was becoming unbearable, ether was administered. During the first ten minutes also sphygmographic tracings of the radials were made for purposes of comparison with those taken immediately prior to the putting on of the bandage. These showed a perceptible increase in the arterial tension. At the end of one hour and thirty-three minutes (5.23 P. M.) a Signoroni's tourniquet was applied to the common femoral just below the groin, having a soft damp sponge interposed between the pad and the skin, and the tubing and elastic bandage were taken off. A momentary test by unscrewing the tourniquet showed the aneurism to be pulseless, but knowing the ease with which a recent clot is washed out of a sac, and experience having proved the innocuousness of prolonged compression, it was determined to keep up the pressure for six or eight hours longer. This was pursued until 8.50 P. M., when the breathing had become so shallow and such signs of œdema of the lungs presented themselves that it was deemed advisable to suspend the ether. This was done, and the tourniquet also removed, when the tumour was found to be hard and without pulsation. The beating of the femoral artery could be traced below the point where the tourniquet had been applied down to the line of compression of the rubber tubing, but below it could not be felt.

During the application of the tourniquet it was carefully watched by an assistant, who kept his fingers on the artery below in order to detect



and arrest any pulsation, should any slipping of the instrument occur. This happened twice, but by such means the arrest of the blood-current by the elastic bandage and by the tourniquet was held complete for a period of five hours and ten minutes without any damage occurring to the limb. A bag of shot weighing seven pounds was then placed over the artery just below Poupart's ligament, and fastened on by broad strips of adhesive plaster, and the limb enveloped in cotton batting loosely secured by a bandage. The thoracic symptoms disappeared in the course of two hours. The shot bag was removed the next day at noon; at that time it was noticed that pulsation in the artery could be felt down to the tumour, and that running inwards from the upper margin of the sac was a small pulsating vessel, which, within the next twenty-four hours, rapidly enlarged. On the third day the patient left his bed, and soon thereafter began to walk about. His general condition also rapidly improved, and by the time he left the hospital, September 24, he had gained greatly in flesh; by that time the tumour was not more than one-third its original size.

It will be noticed that out of the twenty-one collated cases, all but four were aneurisms of the popliteal artery, the exceptions were two affecting the femoral, one the ilio-femoral, and one the anterior tibial artery. Also, of these twenty-one cases, there were twelve cases successfully treated, in two of which, however, a second resort to the bandage was required. In the nine cases wherein failure occurred, fourteen trials of the method were made, but, as pointing most strongly towards the reason for the want of success, in nine out of the fourteen trials made, no subsequent compression of the artery above the aneurism was resorted to. In one of the failures where the bandage was used three times, it is reported that the tourniquet subsequently used was lightly applied until the next day, so as to control but not arrest the pulsation in the tumour. In another case, where three trials were also made, it is indefinitely mentioned that the tourniquet was kept on for "some time afterwards," and in Fleming's case, where Es-march's bandage was applied twice for an hour and forty minutes respectively, no subsequent use of the tourniquet was resorted to. *Per contra*, in every case where success followed, the flow of blood through the aneurism was completely prevented by a tourniquet, digital compression, or otherwise, for a period of time varying from two to nearly nine hours, except in one case, where the loosely applied tourniquet failing to arrest the lessened pulsation in the aneurism, moderate flexion of the limb for several days was required to bring about a cure.

In this continued obstruction of the arterial current after the withdrawal of the elastic bandage and tubing consists the gist of the treatment. I had thought, in first looking up this subject, that failure might be due to the fact that sometimes the elastic bandage was carried over the tumour as well as up to and above it, and that thereby the aneurism was unduly compressed; and that it was sometimes neglected to stand the patient upright before the bandage was applied above the tumour; yet success crowned such apparently imperfect methods.

But there remain certain other cases where, as in Heath's, the com-

pression seems to have been ample, and all the technique of the treatment carefully carried out, yet failure resulted. The case reported by Heath is, however, so peculiar, that the explanation of atheroma offered by Petit (*De la Compression Élastique dans le Traitement des Anévrysmes*. L. H. Petit. *Bull. Gén. de Thérap.*, June and July, 1878) for the non-success of the rapid method in the cure of aneurism hardly applies. In respect to this point made by Petit, it may be stated that a number of successes were noted in patients with marked atheromatous degeneration, that is to say, in the 12 successful cases there were 7 idiopathic and 5 traumatic aneurisms, and in the 9 failures there were 7 idiopathic and 2 traumatic aneurisms.

Before passing to the consideration of such suggestions as have been developed by the examination of this series of cases, it will be well to look for a moment on the reports made respectively by Messrs. Reid and Wagstaffe on the pathological appearances presented some time afterwards in aneurisms thus treated. Reid (*Lancet*, Aug. 5, 1876) had the opportunity of examining the case cured by him some nine months afterwards, and found the artery occluded for  $2\frac{1}{2}$  inches of its course by fibrous tissue, and that the centre and also that portion of the cavity adjacent to the vessel were occupied by an amorphous, non-laminated, coffee-coloured substance of the consistence of cheese, which showed no sign of organization or of vascular connection with the surrounding parts. The portion of the aneurism opposite to its mouth was occupied by several layers of laminated fibrin.

Wagstaffe (*Med. Times and Gaz.*, Nov. 10, 1877) exhibited at the Pathological Society the aneurism that he had treated by the elastic bandage five months prior to the patient's death. The popliteal aneurism was cut across and showed a clot, firm externally, but soft internally, though not laminated. Microscopical examination of the aneurism, Mr. W. reports, had shown that the greater part of the thrombus was organized; the central portion was soft, and contained no vessels. The patient died from rupture of a small aneurism at the root of the aorta, which filled the pericardium with blood. In connection with this condition, *i. e.*, an internal aneurism, it is but wise to call attention again to the caution previously given (*N. Y. Medical Record*, Feb. 2, 1874), as to the effect of increasing the arterial tension by the use of the elastic bandage. In the case now reported in this paper the sphygmographic tracings, it will be remembered, showed, ten minutes after the application of the bandage, a decided increase in the tension at the radial pulse.

In Wagstaffe's case no mention is made by him of the condition of the artery; but, in a communication to the *Lancet*, Nov. 10, 1877, by Mr. Gould, attention is called to the fact that, as in Reid's case, the artery for a distance of some two or three inches was occluded with organized fibrous tissue. Mr. Gould hence attributes the cure of an aneurism by this method

to the occlusion of the artery by the extension of the clot into it from the aneurism, and considers a fairly healthy state of the vessel wall essential for the proper organization of the thrombus. He also thinks that aneurisms with large mouths are therefore easier cured by Esmarch's bandage. In the case which has just been given it was noticed, when the tubing was removed from the limb, that the pulsation of the artery could be traced distinctly to the line of redness produced by the rubber tubing, but not below it. The next day, however, after all compression had ceased, pulsation could be felt in the femoral down to the sac itself, and running to the inside of the latter was an arterial branch, which, in the course of forty-eight hours, markedly increased in size. The explanation offered was that the clot in the vessel had been washed out through the collateral branch. The mouth of the sac was also from the sharpness of the bruit, deemed to have been of small size.

If, as has been supposed, the certainty of success is dependent on the time allowed for the formation of a passive clot in the aneurism, and possibly in the artery leading to it, the important point to be determined is the length of time that is necessary to safely accomplish this. The term safely, it must be understood, applies more particularly to the integrity of the limb. In fact, but little is yet afforded us to determine how long the total arrest of circulation in a limb can be borne. A number of cases are, however, to be found in the medical journals which bear upon the question, such as Wheelhouse's (*Brit. Med. Journal*, Dec. 27, 1873) successful case of complete compression of the abdominal aorta for five consecutive hours for aneurism of the external iliac; also Mapother's case of popliteal aneurism where instrumental compression (complete) was made on the femoral nine and one-half hours (*Brit. Med. Journal*, Oct. 5, 1867); and also more strongly pertinent, the lately reported one of Dr. Erskine Mason (*N. Y. Medical Journal*, Sept. 1877), with whom I was associated in conducting the compression of the common femoral for a varicose aneurism for a period of eighteen hours under ether, during which time the arrest of the arterial current was absolute. In these cases no damage whatever came to the limb. A yet more interesting case is one hitherto unpublished, and kindly furnished me by Dr. B. K. Hoxie, of Auburn, N. Y., where for a femoral aneurism he applied a screw tourniquet to the common femoral immediately below Poupart's ligament, and kept up absolute compression for thirty-three hours and forty minutes without any impairment of the vitality of the limb, save a slight numbness and little œdema. The aneurism was solidified; but ten days afterwards symptoms of suppuration of the sac occurred, and the aneurism was freely opened, discharging some sixteen ounces of grumous blood, dark, and "almost like gunpowder." The case thereafter progressed well. A slight slough ensued at the site of the pressure. While in this case suppuration of the sac occurred, this accident is more reasonably to be charged to

the pressure and to the contiguousness of the slough to the aneurism rather than to the effect of a passive clot, as no sac complication has yet been observed in any of the successfully treated aneurisms by elastic compression.

In respect to the prolonged use of Esmarch's elastic bandage, the experiments of Cohnheim and Jeremoff have shown that, on the lower animals, it can be borne with impunity from six to eight hours; and in the human subject, as experience widened, especially in the treatment of aneurism, the duration of the enforced ischæmia has been increased from fifty minutes at first to four and one-half hours by C. Heath, and to five hours by Barwell, innocuously. These cases afford us so far the severest test of the elastic bandage, with one remarkable exception, which is extracted from the *Wiener Mediz. Wochenschr.*, June 21, 1878. In this case, for the arrest of a repeatedly recurring hemorrhage from an incised wound of the thenar eminence in a boy of 14 years, and after sundry trials of other methods, the hand, forearm, and a portion of the upper arm were enveloped by an elastic bandage, which, together with the encircling tube, were kept applied for *fourteen consecutive hours*. The hemorrhage was arrested and did not recur, but, as soon as the bandage and tubing were removed, rapid swelling with intense redness came on, sharply defined at the constriction produced by the tubing. This in an hour took on the appearance of an acute diffused inflammation, and was associated with a motor paralysis in the hand of a severe degree. Under the use of cold compresses the redness and swelling quickly disappeared in from three to five days, but the paralysis remained for two or three weeks. The nerve-lesion is of little interest, as it has already been recognized as one liable to occur from the pressure of the tubing on thinly protected nerve-trunks, but the absence of the sphacelation that one might have reasonably expected in such an exsanguined patient and the comparatively little reaction that followed the use of the bandage were most satisfactory in the solution of the scientific question.

Surgeons can, therefore, I think, hereafter be justified in continuing elastic compression for a period of time probably much beyond what has yet been attempted. Before endeavouring to arrive at exactness in reference to this period, an appreciation of a variation of the mode of treatment should be had. Gersuny published lately, in Langenbeck's *Archiv für Chirurgie*, Bd. 21, p. 845, 1877, an account of a man in whom an aneurism had formed in each popliteal space. The left one was cured by prolonged intermittent pressure. The one on the right side, after failure with flexion, intermittent compression, mechanical and digital, etc., was unsuccessfully treated by the ligature, and eventually for it, Gersuny, having some fear of gangrene before him, cautiously proceeded to use the elastic bandage every second day for half an hour at a time; in the mean time snugly bandaging the limb and applying Signoroni's tourniquet for six or

eight hours daily. After ten days the elastic bandage was applied daily. By the seventeenth day the pulsations had nearly disappeared, but the treatment was further continued for some six weeks.

It is apparent that this was only a case of intermittent compression, more easily but not more rapidly carried out by means of Esmarch's bandage, for Murray (*Rapid Cure of Aneurism by Pressure*, 1871) states in reference to this that this old method, curing, as it does, by fibrinous lamination, lasted on an average five-and-twenty days.

Billroth (F. Raab, *Wien. Med. Wochenschr.*, Feb. 23 and March 2, 1878) reports a similar case. The application of the elastic bandage up to, lightly over, and above the aneurism, which was popliteal, was resorted to daily for twenty minutes at a time at the greatest, supplemented by the use of Signoroni's tourniquet for from one to four hours. The treatment thus instituted was brought to a successful issue at the end of six weeks.

The result obtained by Monmonier (*Maryland Med. Journal*, June, 1878) is more encouraging, and opens up a plan which is apparently one to be further developed. This case, a popliteal aneurism, was treated by the elastic bandage, purposely compressing the tumour so as to "press the sac close against the condyles of the femur," the obliteration of the aneurism being assisted by a thick compress placed under the bandage. This was retained around the limb for two hours at a time, and was resorted to four times, the control of the artery being secured in the meanwhile by a Skey's tourniquet.<sup>1</sup> Consolidation was found at the end of twenty-four hours to have taken place. The fact worthy of note is that complete arrest of the circulation was effected for twenty-four hours by the alternate use of the elastic ligature and the tourniquet.

This procedure has been more distinctly formulated by Dr. Ferguson (*Lancet*, Sept. 28, 1878), of the Cheltenham Hospital, England, under the title of "Repeated Proximal Applications of an Elastic Compressor in the Treatment of Aneurism." By this method a popliteal aneurism was successfully treated as follows: The india-rubber tubing, without any use of the elastic bandage, and with the patient in the recumbent position, was simply fastened twice around the limb tightly enough to arrest the pulsation in the aneurism. This was left on one hour, and then two hours and twenty minutes of digital compression was used, without producing any change in the aneurism. The tubing was then reapplied for thirty minutes more with the effect of solidifying notably the tumour, but not entirely arresting the pulsation. Digital pressure was again resumed for one hour; then thirty minutes more of the elastic tourniquet was resorted to, the aneurism still faintly pulsating—followed by eighty minutes of digital pressure; again one hour of the elastic tourniquet—pulsation very dubious—followed by, finally, one hour of digital pressure, with a total

<sup>1</sup> From a letter recently received from Prof. Monmonier it appears that the aneurismal sac was only partially emptied by the pressure of the bandage.

arrest of the pulsation. The treatment thus occupied eight hours, in which the tubing was used three hours. No anæsthetic was required. The man was 69 years of age; and the compression by the cord, being just sufficient to stop the pulsation, was not particularly painful.

The method adopted in the treatment of this case is in accordance with the views I have been led to entertain, and I should be disposed to recommend to others, as well as to practise myself, some such plan of *coups à coup*. To set it forth more explicitly, I should, in carrying out this treatment, advise the limb to be bandaged up to and above the tumour, but not over it, as it seems to me considerable advantage accrues from the aneurism being freely exposed so as to readily detect any pulsation. I still think well of having the patient in the erect position before the upper bandage is put on. The tubing I should prefer to have applied, as experience shows that, in some instances, the bandage, however tightly applied, failed to entirely control the blood-current. The constriction from the tubing should only be sufficient to thoroughly arrest the pulsation, and in many cases can be borne without the aid of an anæsthetic. In respect to the duration of the elastic compression, I should keep it on in my next case for two hours, and then apply a tourniquet tightly for two hours, and, if pulsation was still apparent, would repeat both the elastic and mechanical compression until success crowned my efforts. After consolidation has been secured, it is advisable to moderate the arterial current above the tumour for twelve to twenty-four hours thereafter, by either a tourniquet lightly applied, or, better yet, by a bag containing from seven to ten pounds of fine shot, secured *in situ* by strips of adhesive plaster.

No. 37 WEST THIRTY-THIRD STREET, N. Y.

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### ARTICLE III.

A STUDY AND ANALYSIS OF ONE HUNDRED CÆSAREAN OPERATIONS PERFORMED IN THE UNITED STATES, DURING THE PRESENT CENTURY, AND PRIOR TO THE YEAR 1878. By ROBERT P. HARRIS, A.M., M.D., of Philadelphia, Member of the Am. Philos. Soc., Fellow of the Coll. of Phys., Member, and formerly Pres. Phil. Obstetrical Soc., etc.

AFTER a search of nearly ten years, with several interruptions, I have so far completed my statistical work, as to be able to draw from it several valuable lessons for the guidance of future operators, who may be willing to receive instructions from the successes and failures of their predecessors, and anxious to improve upon their work for the good of suffering humanity. I have limited my remarks to one hundred cases, although there are a few in excess of it, in order that all the calculations of per-

centage may be in correspondence with any proportionate number given; five cases representing five per cent., twenty, twenty per cent., etc., the one hundred operations being in the order of their occurrence.

Statistical medical work, to be of value, must not only be thorough and complete, but be separated from the dry detail of tables, and made to appear rather as a commentary upon them, after they shall have been carefully arranged for reference, than as a part of them. I have already given much in the form of abridged reports and tabular records; but, for the balance of cases, shall content myself with a statement of facts derived from them. The collected record of all the cases will be preserved in book form, and eventually become the property of the Library of the College of Physicians of Philadelphia. I have been particularly careful to obtain, as nearly as possible, all the published and unpublished records of the Cæsarean operation in this country; and have so far succeeded, through a persevering correspondence, as to increase the printed record by 43 per cent. By doing this I have largely augmented the list of fatal cases, but at the same time have greatly improved our knowledge of the causes which have led to the fatality of the operation; a result which I regret to find has been frightfully on the increase in the operations undertaken during the last decade.

In studying the record collected, I find it highly important to separate the operation from its results; crediting the operator, only with what he is legitimately chargeable, and resting the balance of the risk upon the delays, errors, etc., to which it properly belongs. The operation of gastro-hysterotomy is a dangerous one in itself, but by no means so much so as our statistics would upon a superficial examination make it appear. We have therefore three important points to consider: 1. What is the real danger of the operation, when performed with a due regard to the physical condition of the patient; the time she should spend in labour; and the safety of the fœtus? 2. How much of the recorded mortality is due to the condition of the woman at the time of the operation; the futile attempts at delivery through an impassable pelvis; and the time wasted by delay? And, 3. What amount of fatality is directly due to the danger of incising the uterus of an exhausted woman; the said organ having by its own muscular activity become materially changed in character, as shown in some instances, by an altered colour or density, or a total loss of the power to contract, when emptied of its contents?

Muscular activity, under the power of the will in our voluntary muscles, first produces a swelling of the parts by the increased determination of blood to them; then a sensation of fatigue, which becomes painful if long excited; and secondarily after rest, a sore, contused sensation in the muscles used, when again brought into action. In the involuntary muscles of the uterus, there would appear to be a progressive change, ending in a loss of contractile force, if not of destruction of tissue. In some Cæsarean

operations the uterus has been found much thickened; in others of a chocolate colour; and in others in a condition approaching decomposition of substance. What changes ordinarily take place in the uterus during long labour can only be determined by a series of microscopical observations in subjects difficult of access; but whatever they may be, I am confident that they have much to do with the danger so markedly increased by delay in operating. It is a mistake to suppose that the great danger is in opening the abdominal cavity. This is done in a variety of surgical operations where the fatality is comparatively moderate; why then should it be so much more dangerous in a pregnant woman? Ovariectomy may be performed safely where there is a fœtus in utero; and a large proportion of laparotomy cases after ruptured uterus recover; where then is the danger in long delay in the Cæsarean operation, unless it be from the increase of risk in wounding a uterus changed by long activity, in an exhausted subject? The bearing of this view will be seen to advantage, when we come to examine our record of operations upon dwarfed subjects.

*The condition of the woman* to be operated upon, is to be considered in two aspects: 1st. What was it prior to the commencement of labour? And 2d. What is it at the time the operation is entered upon? The case may have been rendered unfavourable by previous disease, dwarfing or deforming the body; or by some present malady of more recent date; or be made much more serious than it otherwise might have been, by reason of futile attempts at delivery, or unnecessary delay on the part of a midwife, the accoucheur, or the surgeon himself, although we are glad to find that the last has rarely been chargeable with any uncalled-for postponement in our country, after having been called in to operate.

*Dwarfed Subjects.*—Of these we record nineteen. Sixteen cases were the result of rickets in childhood; one had an exostosis of the sacrum; another had lordosis and ankylosis, with the right thigh nearly at a right angle with the pelvis; and the remaining one was a member of a family of dwarfs. These varied in height from 3 feet to 4 feet 8 inches, and in weight from 65 to 115 pounds; and will readily be believed to have been unfavourable subjects for so severe an operation. If nearly one-fifth of this class of operations is to be performed upon women who have been rendered diminutive and feeble by rickets, then how important is it that their little strength should not be wasted by delay, or their cases made almost necessarily fatal, by craniotomy, version, or other futile efforts at delivery. It cannot be a very difficult matter to determine the amount of pelvic contraction in these cases, at least with sufficient accuracy to decide, whether or not the Cæsarean section will be found a matter of necessity; or of a wise election, as compared with craniotomy, embryotomy, and cephalotripsy. If, according to the investigations of Parry, whose decision I have verified by my own researches, it be correct, that craniotomy has scarcely a fractional advantage in saving life, over gastro-



hysterotomy, in cases where the conjugate diameter of the superior strait measures  $2\frac{1}{2}$  inches or less; and not even this claim, when the latter is performed as it should be, very early in labour; then it becomes all important to make an early decision before the powers of the patient have been wasted, the fœtus perhaps lost or destroyed, and the case unfitted for the knife.

That a dwarf even of very diminutive stature may endure the abdominal section with success, we have in proof, by the report of the case of Ernestine Leher, of Brest, France, operated upon by Dr. J. Cœr. Mayer, on May 30, 1874. This rachitic subject measured but 91 centimetres, or  $35\frac{7}{10}$  inches in height, and yet her life and that of her son Cæsar were saved by an early operation, she having been in labour but a few hours. Labour commenced in the morning; Drs. Mayer and Delattre were called in at  $1\frac{1}{2}$  P.M.; found the conjugate  $1\frac{6}{10}$  inches; summoned other consultants who confirmed their decision to operate, and the section was made at 3 P.M. (*Archives de Tocologie*, Paris, 1874, page 513). This commendable promptness of Dr. Mayer and his associates might well be imitated to advantage in our own country.

The conjugate diameter has been noted in 14 of the 19 dwarfs, and in only one instance did it exceed 2 inches, and in 10 of the 14, it varied from  $\frac{5}{8}$  of an inch to  $1\frac{3}{4}$ . One would suppose very naturally, that under these circumstances it would be an easy matter to decide early, as to the necessity for the use of the knife; but what are the facts? By a careful examination, we can only rate 7 of the 18 operations as *timely*, and these saved 5 women and 5 children, all the seven children being alive when delivered but one. There were 8 women operated upon within 24 hours from the commencement of labour, all of whom recovered but 3, and 6 children were saved. The 3 women who died were all exceedingly small, viz., No. 5, was 3 ft. 6, white, conjugate  $1\frac{3}{4}$ , in labour 16 to 18 hours, but much exhausted before the operation. Her child was of full size, and lived; she died of peritonitis on the second day. No. 14, 3 ft.  $6\frac{1}{2}$ , white, conjugate  $\frac{5}{8}$ , a cripple and on crutches from early childhood, in labour 8 or 9 hours, died of exhaustion, escape of lochia into the peritoneal cavity, and commencing peritonitis in 20 hours. No. 19, 3 ft. 4, white, 65 pounds in weight, conjugate 2 inches; "operation early," woman died of peritonitis and degeneration of uterine tissue, in 5 days; child weighed 6 pounds, 20 inches long, and lived.

Eleven dwarfs were operated upon, on the second, third, and fourth days of labour, viz., 4 on the second day, one woman and two children saved; 3 on the third, one child saved; and 3 on the fourth, with one child saved.

In view of the fact that *but one dwarf was saved out of 11 who were operated upon, after the first day of labour*, it will be profitable to examine into the causes which led to so unfavourable a result as compared with that of the operations performed at an earlier period. I number the cases

in the order of their occurrence, simply as a matter of convenient reference.

No. 2, white, 4 ft. 1, conjugate diameter  $1\frac{3}{4}$ , was  $3\frac{1}{2}$  days in labour, under care of a midwife; child dead, woman under febrile excitement before operation; died in 4 days of *peritonitis*. No. 6, white, in labour 30 hours, and much exhausted; woman died of *peritonitis* "in a few days;" child lived and grew up. No. 7, black, 3 ft. 6, conjugate  $1\frac{1}{2}$ , in labour 50 hours, and much exhausted; child 6 pounds, and dead; woman died of *exhaustion* in 4 hours. No. 8, white, conjugate 1 inch, in labour 4 days; craniotomy attempted, and promontory of sacrum punctured in three places, through the walls of the rectum, in mistake for the fetal head; woman died in 6 days, from the *injury to the rectum*; child lived and thrived. No. 10 black, conjugate  $1\frac{1}{4}$ , time in labour not stated; child lived to age of 19; woman did well for 4 days, and was in a very fair way for recovery, when she threw herself into convulsions by a *dinner of dumplings*, causing her death in two hours. No. 11 white, 3 ft. 2, conjugate  $1\frac{1}{4}$ , in labour 42 hours, child 9 pounds, mother 70; craniotomy attempted, and persevered in for 3 hours, the woman becoming completely exhausted; died of *peritonitis* in  $63\frac{1}{2}$  hours. No. 13 black, 3 ft. 9, five months pregnant; in labour nearly 2 days, brought on by an attack of dysentery, followed by *peritonitis*; woman had been operated on once before, and her child saved, after a labour of only  $4\frac{1}{2}$  hours; she died in five days of the *pre-existing entero-peritonitis*. No. 15 white, in labour 3 days, two of them under the care of a midwife; craniotomy first performed by the operator, failing in which, he discovered the necessity for gastro-hysterotomy; woman died of *peritonitis* in 72 hours, as might have reasonably been expected. No. 16 white, 3 ft., conjugate 3 inch., spinal deformity, breech presentation, operation on third day of labour, after failure in version and trial with the blunt hook; woman died of *exhaustion* in  $51\frac{1}{2}$  hours; child saved. No. 17 white, Irish, scarcely 4 ft. high, conjugate  $1\frac{1}{2}$ ; advised to have an abortion produced when about half gone in pregnancy, but declined; in labor, at term, 3 days under a midwife, who gave ergot freely; pulse 120 before operation; inertia of uterus, hemorrhage, no uterine sutures used; died in 8 hours; no autopsy; hemorrhage thought to have returned; child dead. No. 18 white, 3 ft.  $11\frac{1}{2}$ , stout, 115 pounds, conjugate  $\frac{7}{8}$ ; woman under observation of two accoucheurs from 9th hour of labour, but not operated on until in labour 38 hours, and much exhausted; the membranes were unruptured. The woman was very fortunate to recover under the circumstances; the child also was saved. With such a conjugate there was no question as to the form of delivery, and much danger in the delay in operating. This woman was not only dwarfed, but her pelvis was nearly closed up by an exostosis growing from the sacrum.

It is a little remarkable that of 23 dwarfs operated upon by the Cæsarean section in North America, whose cases we have on record, 18 were whites, and only 5 blacks, although rachitic deformity of the pelvis has been quite prevalent among the slave population in some localities of the South, particularly in parts of Louisiana; still, not one of the 18 operations credited to that State was performed upon what would be properly classified as a dwarf woman. There have been 10 operations upon dwarfs reported from the former slave States, and 6 of them were upon white women.

The record of Pennsylvania shows a majority of her Cæsarean subjects to have been rachitic dwarfs, or 5 out of 9 cases, with but one black; three of the four operations upon white dwarfs, by being performed early, were successful.

Our record of American Cæsarean operations upon dwarfs very clearly sets forth the value of early, and the risks of late, surgical delivery. A dwarf, being healthy, but inferior in powers of endurance, must have the advantages of an early, a very early, operation, if we expect to save her life; give her this, and she will, in the majority of instances, recover; exhaust her by delay, or a trial of impracticable expedients, and the record reads, "death by shock, exhaustion, peritonitis, or septicæmia." There is clearly an intimate connection between the condition of the patient at the time of the operation and the result; so much so, that by a record of the case up to the time of the incision, we can in a majority of instances give a correct conjecture as to the final result. *Dwarf No. 12*, now living, was operated upon in this State seventeen years ago, after a labour of only 2 hours, by the late Dr. Barnes, of Northampton County, and was already, in that short time, showing signs of becoming exhausted. What hope would there be in saving such a case even with but one day's delay? *Dwarf No. 16*, also of this State, was about the size of Dr. Mayer's case in Brest, already referred to, and might have been saved if delivered with the same promptness; but there were points of difference, which gave a hope of delivery through the pelvis in the latter, until too late to secure success under the knife. This excuse could not be given for the delay in cases where, even Dr. Barnes, of London, would admit that the operation by the knife was alone practicable. There must be a vast amount of ignorance in the land to account for the culpable management of the great majority of cases of labour in women with deformed or impassable pelves.

Rachitic women generally belong to the lower walks of life; and, from their position, in the large majority of instances, engage as their attendant in labour, either a midwife, often of the lowest grade, or an accoucheur who has but a very imperfect knowledge of the higher obstetrics. These people are often a long time before they recognize the fact that there is something serious in the case, and even then it does not occur to them that perhaps delivery *per vias naturales* is utterly hopeless; so they wait and wait, until friends become anxious, and they request a consultation, send for an accoucheur, a surgeon, or both, and finally, perhaps, a dozen doctors. The accoucheurs consult, try various expedients, waste perhaps some more valuable time, and at last decide that there is no hope but in the Cæsarean operation, and the patient submits to the use of the knife to obtain rest from suffering, in a condition of exhaustion which is calculated to make it in a few hours or days the *rest of death*. And then there is a grand hue and cry about the dreadful danger of the Cæsarean operation, and it is denominated the "*forlorn hope*," "*the last resort*," "*the most dangerous*

*operation in surgery,*" etc. "There's nobody to blame; the surgeon was very skilful, and managed the after-treatment admirably; but then the operation is so dangerous that scarcely any one recovers from it." What does the operator say, and what have a number of such written to the author of this paper? "*The case was rendered hopeless by delay before I was called in; had I been summoned early, I have very little doubt but that the woman would have recovered.*" A careful surgeon knows the importance of having his patient in as good condition as his disease or injury will allow before he operates upon him. He is often weeks in preparing the case for the knife, because, by so doing, he hopes to save him from its effects. An operation is not to be measured by the mortality that follows it, for the gravity changes with the condition of the case. Tracheotomy is not a dangerous operation in itself, and yet death follows it much more frequently than gastro-hysterotomy, and so also is it the case with many other operations in surgery. The real question at issue is, what is the true rate of mortality after gastro-hysterotomy under the advantages which a careful management of the case is capable of affording it?

*Cases of African Blood.*—I cannot find any ground for believing that the question of race has had any special bearing upon the mortality which has followed the Cæsarean operation in the United States. At first it might appear that the blacks possessed an advantage over the whites in the proportion of recoveries to deaths; but a close observation shows that this has been due to conditions which are not dependent upon any ethnical peculiarity. The promptness, care, and skill often exercised by French operators under the slave system, gave, in many cases, an advantage to the black over the less fortunate white; but, where the circumstances are similar, the results have varied but little in favor of either. 52 white women and 48 blacks compose the 100 cases; 18 whites and 26 blacks recovered, and 34 whites and 22 blacks died. One-half of the saved blacks were in Louisiana, and ten of the 34 whites who died were dwarfs. In the last ten years five blacks out of six operated upon died.

*Mortality of the Children.*—Of the whites, 25 children were born alive, of whom 5 soon died; and 27 were dead on delivery. 23 black children were removed alive; 3 died, and 25 were dead on delivery. There is in the profession a disposition to undervalue to a great degree the life of the foetus as compared with that of the mother, and to sacrifice it for her benefit with very little hesitation; hence, the popularity of the cephalotribe, especially in Great Britain, where it is used in exceedingly contracted pelves. In many of the hundred cases the child was sacrificed to no purpose, and the case lost by the consequent delay and exhaustion. To save the child is often to save the mother, and, where the operation is timely, both are in the majority of cases preserved. If more regard was paid to the life of the foetus there would be more promptness in deciding to operate, and many less deaths to record against the operation. In a

letter recently received from Dr. Thomas Radford, of Manchester, England, he says: "The salvation of the infant is a principle of first importance in my mind. The present practice seems to be running into the line of a destructive character. Craniotomy and cephalotripsy. . . . The Cæsarean section should be considered an operation of election, and not one of necessity." Dr. Radford has twice operated, the first time thirty-five years ago, and has assisted in *four* other cases. He is the author of a work entitled "*Observations on the Cæsarean Section*," 1865, and a supplementary pamphlet, 1868, containing the records of 98 operations performed in his own country.

The cause of death of the fœtus from prolonged labour cannot be very satisfactorily determined, except in a few cases. We are obliged to attribute the deaths to uterine pressure as a general agent, but are forced to conjecture as to its method of application. We know that ergotic contractions, being more violent than those of a purely natural character, are very dangerous to the life of the child when seriously obstructed in its exit, and we infer that pressure is the element of danger, but cannot tell positively whether this is fatally exerted upon the brain, the bloodvessels of the body, or both. Where the fœtus lies transversely, and is bent laterally in the pelvis, death no doubt comes by obstructed circulation, aided perhaps by distortion of the spine and pressure upon the spinal nerves; but where the head presents, recent observers have attributed the death to pressure upon the cranium. One thing, however, is certain, death takes place in some cases at an unaccountably early period, and in others life is preserved during several days of active uterine effort. If the placenta and cord are so placed that they escape pressure between the uterus and fœtus, and the fœtal ellipse be well maintained, the child be perfectly developed, and the head prevented from undue pressure upon a small surface, I see no reason why it should not live a long time, even after the amniotic fluid has, in a large measure, escaped. I know that children do live through very long labours, and believe this the most plausible method of accounting for their preservation.

Of the 52 children delivered dead, 24 had been subjected to prolonged uterine pressure during the delay in delivery, 8 were destroyed by instruments, 5 were transverse presentations, and impacted in or upon the pelvis, 5 died before labour came on, the gestation having been prolonged, 2 were lost by prolapsus of the funis, 1 by ergotic contractions, 1 by convulsions in the mother, 2 were premature, and in 4 the cause was not mentioned or anything definitely given by which death could be accounted for. This degree of mortality is much greater than that of Great Britain, where 56 children were saved out of 98, although but 16 of the mothers recovered. Contrast the mortality of the fœtus in our 100 operations with the number lost in the cases operated upon on the first day of labour, and we find a vast proportionate difference in favour of the latter. 24 women are known

to have been delivered on the first day of labour; and there are reasons for believing that 6 others should be added to this list. Of the 30 children delivered from these women, 27 were alive, of whom 3 soon died, and 3 were dead on removal. Thus we have 30 operations saving 24 children, against 70 by which but 16 were saved, showing the great importance to the foetus of an early operation.

*Mortality of the Women.*—Although it is by no means fair to charge the losses under the Cæsarean section to the operation, when in so many cases it was resorted to after the condition of the patient rendered it hopeless, it is of interest to know that notwithstanding the numerous instances of bad management, 44 women were saved, or four more than the number of children. What the proportion might have been we can estimate, by selecting *those who were in a favourable condition* at the time of the operation, and had not been more than a reasonable period in labour, but one of them as long as twenty-four hours. Of this class of cases I find but 24 in which the points mentioned are particularly noted, and out of this number 6 were lost and 18 saved, or 75 per cent.; all of the children being alive but 2, and 19 being saved, or 79 $\frac{1}{6}$  per cent. I was satisfied several years ago that this operation, performed under circumstances of time, health, and conditions calculated to favour it, ought to save in our country from 65 to 75 per cent. of the women and children, and, although I have nearly doubled the collection of cases since, and largely increased the proportion of deaths in the whole number, I still find my original estimate of promptly relieved cases to be correct.

*Causes of Death in the Women.*—We frequently hear of the great danger of death by *hemorrhage* under the Cæsarean operation; but this is a great error. There is an indirect danger from this source, but it does not arise from the amount of loss, but from the poison generated by the decomposition of, it may be, quite a small portion of escaped blood in the abdominal cavity. This is one of the dangers of a late operation, and seldom follows, when it is done early, for the simple reason that an exhausted uterus does not as a general rule contract well, or if it does, maintain the contracted condition so as to keep the uterine wound tightly closed. There is danger from hemorrhage in the operation, provided the uterus does not contract promptly after the foetus has been removed, and especially in cases where the placenta is in the line of the incision, or the obstruction to delivery lies in a large uterine fibroid; but this accident of delivery has a remedy in ergot previously administered, in uterine palpation, the introduction of ice into the uterus, or in the failure of these, the closure of the uterine wound by silver wire sutures. In the 56 per cent. of deaths there are but four cases in which hemorrhage is recorded as a special element: of these two were affected with fibroid tumours; one in a crippled dwarf, and the other in a case of prolonged gestation, bearing a putrid foetus, and having no distinct labour pains. The third was almost pulseless when

operated upon, and had been in labour four days; and the fourth was under a midwife for three days, and dosed with ergot. There may have been some secondary concealed hemorrhage in some of the cases recorded as having died of exhaustion, but in most of these women there was a condition of extreme prostration prior to the operation.

The term *exhaustion* is a convenient one for the cause of death, and a correct one in many instances, but a very unsatisfactory one in others, especially where the woman has survived the operation several days. 15 deaths are attributed to this cause, all in cases of prolonged labour, the time varying from 26 hours to 15 days. 7 died within seventeen hours; 4 on the second day; 2 on the third; 1 on the fourth, and 1 on the sixth. I believe that an element of septic poisoning exists in some of the later cases of apparent "shock and exhaustion." A woman is prostrated by a long labour, and is operated upon in this condition; if she does not fall a victim to the shock to the nervous system, in a few hours, she will perhaps rally a little, remain weak and almost pulseless a day or two and then die. She may die simply of the exhaustion and shock; but make an autopsy, and you will find pathological changes in the uterus and abdominal cavity that indicate other complications; the uterine wound is open, and it may be slightly gangrenous; there is at least little or no attempt at union; there is a bloody fluid in the abdomen, it may be in very small amount, and there are evidences to the eye of a congestion or slight inflammation of the peritoneum; the heart also, if opened, will perhaps present a fibrinous clot of recent formation, indicative rather of the method of death than of any real cardiac disease. To avoid this condition, there is only one remedy, *operate early*. Look at the timely cases in our American record, and imitate the promptness with which they were undertaken. Why were Prevost, Gibson, Hoffman, Scudday, Mills, and others so successful? because of the fact that their patients were in labour but a few hours before relieved of exhausting suffering.

*Peritonitis* is the great dread of the abdominal operator, although gynecologists are becoming much less afraid of exciting it than in former years. It is certainly much to be feared in gastro-hysterotomy, and will make its appearance even where the condition of the patient was favourable at the time of the operation. But there is this consolation, it may be avoided in large measure by an early resort to the knife whilst the patient is still strong, and the uterine contractions active. It is a form of inflammation that finds its home in exhaustion, being of the adynamic type in many subjects, like its near relative, erysipelas. Eighteen operations resulted in peritonitis and death, only four of the women having been in labour less than a day; the other fourteen varying from a little more than twenty-four hours to nearly four days. But one of the four cases in women operated upon early, presents no assignable reason for the attack. No. 18 of my case-book was a dwarf of 3 feet 6, and exhausted before the operation.

No. 94 was but 3 feet 4. No. 61 was in delicate health, and had also her ovaries removed in the operation. But No. 41 was in good condition, had a timely operation, and still fell a victim to peritoneal inflammation in a little over four days.

There is certainly a very marked connection between a long delay before the Cæsarean section is made, and a peritonitis as an after result. There are exceptions both ways, a prolonged case escaping, and an early one being attacked; but the general rule favours the timely operation. We can readily see how an exhausted patient would die of shock and exhaustion after an operation of so grave a character, but how prostration of system favours an attack of peritonitis we cannot so readily comprehend. We have seen repeated attacks of erysipelas follow a wound in an enfeebled subject (in one case seven times), and as the two forms of inflammation very nearly resemble each other, we infer that debility favours the approach of either. Another element that enters into the production of peritonitis is the sensitive condition of the uterus after a long labour to traumatic inflammation when incised. As a contused muscle is not a good one out of which to make a flap in an amputation, so the uterus, when affected by pressure upon a resisting fœtus, is not in a safe condition to incise, as such an interference may bring on metritis, metro-peritonitis, phlebitis, or septicæmia. In early labour there seems to be much less risk.

It will be profitable to note the conditions of 13 women, prior to the operation, who afterwards fell victims to peritonitis, viz.: No. 9 exhausted by an attempt to deliver by craniotomy. No. 13, in labour  $3\frac{1}{2}$  days under a midwife—exhausted and feverish. No. 14, in labour 2 days under a midwife, imprudently got out of bed on 5th day—died on 8th. Nos. 21, 23, 24, 55, 73, 80, 81, and 87, all protracted labours. Nos. 50 and 84, both long labours, with craniotomy; 84, two days under a midwife, and one additional under an accoucheur. Two women died on the second day, six on the third, two on the fourth, one on the fifth, one on the eighth, and one on the tenth. The one who rose too soon was not attacked until the fifth day after the operation.

*Septicæmia*, as a cause of death, is reported in only two instances, which I believe to be far from the truth, although unintentionally a misstatement. A woman, after a culpably long labour, with perhaps a failure in craniotomy or version, endures *in extremis*, or near it, the Cæsarean section. She is relieved by the removal of the fœtus; rallies somewhat; lives a few days in a weak condition; has some peritoneal symptoms, and dies. One observer calls it a death from shock, another exhaustion, a third peritonitis, and a fourth septicæmia, when perhaps, as is the case in the large majority of instances, no autopsy was permitted to be made. What is the real cause of death? We open the body of a woman, and find scarcely a sign of peritonitis, at least apparently not enough to occasion her death; but the uterine wound is open, its edges are unhealthy, there are evidences of slight gangrene in them, and perhaps pus escapes under pressure: there is



also more or less blood in a state of commencing or advanced decomposition in the abdominal cavity; and an unhealthy-looking matter in the cavity of the uterus. Here are exciting causes enough for septic poisoning. Did the woman die of it? The microscope, and a careful minute examination of the uterus, and a few remote organs and their vessels, must determine this. If the blood found, or the escaped uterine discharges, are the *fons et origo* of the condition that has led to death, then how important to secure the uterine wound by sutures, and establish a proper drainage *per vaginam* to prevent such a mishap. If the uterus will contract sufficiently well in the early hours of labour to avoid this necessity, then how much better to operate in good season and obtain this advantage. Inflammation which has no element of septic poisoning, is not necessarily fatal, and a patient may recover even when the attack has ended in the formation of an abscess, as in case 22, where the patient had been in labour only a few hours. In a second operation the recovery was without any special element of danger. Inflammatory sequelæ are not uncommon in cases of early operation, but they are of a more healthy type than after late ones, and much more seldom end in death. Evidences of local peritonitis ending in the formation of adhesions have been discovered on several occasions under second operations, where the symptoms of the peritoneal implication were not all pronounced at the time of the attack.

*Previous disease* may so weaken the body and impair the health, as to render the Cæsarean operation much more than usually serious. In Europe, the usual depressing malady is *mollities ossium*, which we fortunately have not to contend with in the United States. Here, what is most common, is a delicate, deformed frame, the effect of rachitic growth in childhood, leaving the woman with a depressed power of endurance. Albuminuria—fibroid growths in the uterus—coxalgia—dysentery—intermittent fever—and prolonged gestation from occlusion of uterus, are recorded as existing in patients prior to operation in the United States. Of six cases of fibrous tumour, four intra-uterine, and two pelvic, all died but one of the latter, who had also intermittent fever: she was operated on when in labour fourteen hours. Of four cases of *eclampsia*, all died but one, which was not uræmic; children were all lost. There were three cases of *prolonged gestation*, one of about forty-four months, one twenty-one or twenty-two, and one several weeks over time. In all, the fœtus was putrid, and the patients in bad health. In two there had been local peritonitis, and the adhesions enabled the operator to open the uterus without exposing the abdominal cavity—these women recovered; the third brought on peritonitis by folly in eating, about the tenth day, and died. All had inflammatory occlusion of the os uteri. It is a question whether these women might not have been operated upon by hysterotomy,<sup>1</sup> as this

<sup>1</sup> See two cases of this operation on same woman, with success to her and the children, by Mr. Alexander Tweedie, in *Guy's Hospital Reports*, vol. ii. p. 258.

operation has proved successful even where there was no appearance of an os discoverable: the section can be made under eye by the aid of a speculum. Fibroid tumours are not necessarily a fatal complication in gastro-hysterotomy, although no woman with such an obstacle to delivery within her uterus has survived the operation in the United States. If the tumour should be seated low down in the posterior part of the organ, and the operation be performed early, the hemorrhage ought to be controllable by wire sutures, and the patient saved. Dr. Cazin,<sup>1</sup> of Boulogne, France, operated in a case in 1874, on the fourth day of labour, and although there was inertia of the uterus, and the woman fainted from the hemorrhage, he was enabled to arrest it entirely by five uterine sutures of silver wire, and both mother and child survived. After the operation the fibroid commenced to diminish in size.

*Uterine sutures* have been employed in fifteen cases of Cæsarean section in the United States (see account of cases in this *Journal* for April, page 326). In a letter recently received from Dr. James Parrish, of Portsmouth, Virginia, reporting a case which he believed to have died from hemorrhage, he remarks: "My decision not to use uterine sutures was mainly determined by the very decided attitude of Cazeau upon this point. Yet that it is very bad practice, indeed, I have now no manner of doubt." The woman had been in labour under care of a midwife for three days, and ergot freely administered—hemorrhage was quite free from the uterine incision, and difficult to arrest, as the uterus was slow in contracting—ice was used with effect, but it was thought that the uterus must have relaxed after the abdomen was closed, as the patient sank, and died in eight hours. Similar cases have been saved by the silver-wire suture. In no *timely* operation except in one instance were sutures required, and in this one, the knife had cut through an intra-mural fibroid, which caused the wound to gape open.

*Antiseptic Treatment.*—This includes a variety of expedients to prevent blood-poisoning. 1. Sponging out the cavity of the abdomen, and in cases where the fœtus has been putrid, the uterus also. 2. Drainage through the vagina, abdominal wound, or both, by Chassaignac's tubes, or Winckel's méche, and the use of the syringe to wash out the discharges. 3. Keeping open the lower part of the abdominal wound for inspection, and escape of noxious fluids. 4. The use of Lister's dressing to the abdominal wound. 5. The employment of the irrigator to the abdomen, to keep down the temperature of the body; this saved a very unpromising case at the hands of Dr. Fowler, of Alabama, in 1866, after a labour of sixty hours (see case 52, April number), the patient being not only exhausted, but anæmic from loss of blood. 6. The re-opening of the abdominal incision for the removal of escaped uterine discharge, or purulent accumulation, and syringing out the cavity containing it: this was done

<sup>1</sup> Archives de Tocologie, vol. i. 1874, p. 704.

in 1827, by Dr. Richmond, of Ohio, who thereby saved his patient (case 2, April number).

*Cæsarean Operations Increasing in Fatality in the United States.*—Instead of progressing toward success in latter years, as all the other varieties of abdominal surgery have been, we have been most decidedly retrograding, under the instruction of those who teach that gastro-hysterotomy is to be regarded as the “last resort,” and never an operation of election, if there is a possibility of delivery by cephalotripsy, even although it may rightly be considered equally dangerous to the mother. This leads to experiments, failures, loss of time, and a delay that is very often fatal. To demonstrate the fact of retrogression, I have divided the last forty years into its four decades, and present the following as their respective records, viz. :—From 1838 inclusive, to 1848—8 operations—4 women recovered, 4 died, 5 children delivered alive, 3 *timely operations*. . . . 1848 to 1858—27 operations—13 women recovered, 14 died, 15 children delivered alive, 8 *timely operations*. . . . 1858 to 1868—23 operations—13 women recovered, 10 died, 8 children delivered alive, 5 *timely operations*; 8 cases with no deformity of pelvis recovered, four being cases of impaction of the fœtus in the transverse position; two, vaginal occlusion; one, impaction of the rectum with clay; and one, impaction of fœtal head in the pelvis, a very unjustifiable operation. This accounts for the greater mortality in the children. . . . 1868 to 1878—27 operations—4 women recovered and 23 died, 13 children delivered alive and 14 dead, *timely operations* 5; remainder, 2, 3, 4, 7, and 15 days in labour, there being three of the last. The manner of death as recorded, is indicative of the effect of long delay, *i. e.*, peritonitis 8, exhaustion 8, hemorrhage and exhaustion 2, septicæmia 2, etc. Here we have again the evidences of the importance of an early resort to the knife, its value in saving life; and the danger of a long labour in making recovery almost impossible. View the subject in all its aspects, and we find that it leads us to the same point. There is a fair prospect of saving both mother and child by an operation during the first hours of labour, and this hope diminishes as labour advances, until there is a marked falling off; and, finally, the prognosis becomes exceedingly unfavourable, as very few escape. Until these facts become generally known to the midwives and obstetricians of the United States, we may still expect them to act in the same way as they have so long done. The ignorance displayed in managing the cases during the last ten years, and their frightful mortality, are both discouraging and appalling. It is also disheartening to find that 10 of the worst cases of delay ending in death, were under treatment in cities, in several of which are medical schools. Eight were cases of deformed pelvis, and two of exostosis. They were in labour from two to four days or more—two were two days, five were three days, one was four days, one was “several days,” and one “exhausted by long labour.” How many of the twenty-

three women whose cases were fatal during the last ten years were first under the care of a midwife, I am not able to say: in five, the fact that they had been, is mentioned, but it is fair to presume that the delay commenced with them in quite a number.

*Hospital Cases.*—As yet, but two operations have been performed in the hospitals of the United States, and both cases died because of delay. There is no reason why cases might not do well in hospitals; and it is a pity that the poor and ignorant could not have the benefit of hospital skill from the moment of falling in labour, and thus escape the dangers of mal-practice under stupid midwives. The experience of Paris is not in favour of hospitals, as they have not been successful in that city, for reasons, one of which will be learned by the following report of Dr. M. M. Rogers to the *Buffalo Med. Journ.*, in June, 1851:—

In January, 1851, a rickety dwarf of 24 years of age was taken in labour at the Hospital Clinique des Accouchemens, of Paris, the waters soon broke, and after a labour of six hours, finding a conjugate of  $1\frac{1}{4}$ , the chief called in the late Baron Paul Dubois, who with Prof. De Paul consulted upon the case, and decided that the Cæsarean operation must be performed. The woman by this time (9 P. M.) was becoming exhausted; her child was living, and she required as early relief as possible; but instead of operating at once, they postponed doing it until 10 A. M., when it took place with due skill and quickness in the amphitheatre before the class. By this time (nineteen hours labour) the child had perished, and the woman was much exhausted. She sank after the operation, to die of collapse in 36 hours.

In the April number of this Journal I related an exactly similar case for the same hospital, that ended in the same way; the consultants being Drs. Cazeau and Moreau, and the latter the operator. The operation took place in 1837, and had been postponed over twenty hours, making the labour 36 hours—death in same way, but much sooner. The women and children were lost, but then the class saw two beautiful operations. As I have no fear of our surgeons sacrificing humanity to science in this way, this hospital objection is not any obstacle to success here. The difficulty lies in securing the patient in time, whether for private or hospital treatment.

*Induction of Premature Labour, as a Method of Escape from the necessity of Performing Gastro-hysterotomy.*—This is a very beautiful plan in theory, but not at all easy to put into practice. There are many women of the better class who may be so contracted in the pelvis as not to be able to bear a living child at term, and yet who are far from requiring that the Cæsarean operation should be performed. To such women, the saving of a living child by an artificially excited labour, at an early period, consistent with viability, is a great blessing; and the proposition to perform the operation, is one that appeals to their sense of reason, and is often responded to accordingly. But the subjects of infantile rickets are usually

of a different class, and much less likely to be properly impressed when appealed to in adult life after they have become pregnant. Besides, in many cases it would be impossible to remove a viable fœtus because of the excessive deformity, a space of  $2\frac{1}{2}$  inches conjugate being required, according to Kiwisch, for one of the 30th week to pass through. In several instances the attempt has been made to induce deformed women to submit to an abortion, and they have almost uniformly declined, and this has been done even after they have on a former occasion been obliged to endure the risk and suffering of the Cæsarean section. I will illustrate these facts by two examples. In June, 1877, Prof. Edward W. Jenks, of Detroit, delivered a German woman of 24, by the Cæsarean operation, after a labour of 7 days, during which time she had been in the hands of a party of women, assisted finally by a midwife. The woman had a deformed pelvis, and the child's arm protruded; she made a very remarkable recovery. Last spring she was pregnant again, and Dr. Jenks, in order to avoid the risk of a second operation, tried to persuade her and her husband to let him bring on labour prematurely, but to no purpose. They were both stupid and ignorant—the husband did not want “to have the baby disturbed”—and the wife said she would run all risks. Fortunately the fœtus died, became putrid, and she aborted. . . . In May, 1875, Dr. James Parrish, of Portsmouth, Virginia, was consulted by an Irish primipara, scarcely 4 feet high, deformed, having a conjugate of  $1\frac{1}{2}$  inch, and about half advanced in pregnancy, as to the possibility of her being delivered at term; and he advised the immediate production of abortion, which she declined from religious scruples. In September she placed herself under the care of a midwife for delivery, ergot was freely given, and after three days' trial Dr. Parrish was sent for. She survived the Cæsarean operation eight hours. If we could give such people the requisite degree of intelligence, we might hope to be able to induce them to submit, by demonstrating the abnormal anatomy of their pelvis; but the words would be as an idle tale, as they evidently were to these two white women of foreign birth. Other instances of a declination of a similar character might be mentioned.

*What is a Timely Cæsarean Operation?*—The record of cases examined clearly establishes the fact, that a section to be in season to save both mother and child should be early. If a dwarf begins to show signs of exhaustion after labour of from two to six hours, then her operation should take place, according to this measure of time, if the labour is active; it may be as late as ten or twelve hours, if she is strong and has a good pulse. When the os uteri is sufficiently opened for drainage, the case may be operated upon. As a general rule, the earlier the operation, the more likely is the patient to recover. Women who have not had rickets and are well grown and robust, can bear with safety a much longer delay, as shown in the results of operations for impacted fœtus. I thought at one time that an operation within the first day of labour should be

esteemed early; but the reports of cases of women exhausted within this period, have caused me to alter my views.

*Operations of Election.*—Great as are the admitted dangers of craniotomy, cephalotripsy, and embryulcia, to the mother, there are those who appear to hold to the opinion, that we should never make choice of the Cæsarean operation, if the fœtus can by any possibility be delivered *per vias naturales*. We have had women in the United States who endured several hours of suffering under craniotomy, and narrowly escaped with their lives, who were afterwards delivered safely of living children by gastro-hysterotomy. In 15 of the 100 cases reported, the operation was predetermined on account of former, or anticipated difficulties, and the same arranged for, by the operator. In 13, the women recovered, and all of the children were delivered alive but one, the child presenting by the arm. In five instances the Cæsarean operation succeeded a former delivery by embryulcia, as an operation of election, and all the women and children were saved. Dr. W. S. Playfair says, in his treatise on Midwifery:<sup>1</sup> “Great as are the dangers attending craniotomy in extreme difficulty, there can be no doubt that we must perform it whenever it is practicable, and only resort to the Cæsarean section when no other means of delivery are possible.” This is the generally accepted doctrine of the English school of obstetrics of the present day, although Radford, Greenhalgh, and a few others are opposed to it. Denman and Meigs questioned the propriety of repeatedly performing craniotomy in the same woman, and the latter was one of the first to act upon it in the United States, when he refused thus to deliver Mrs. Reybold in her third labour.

Dr. Playfair says, “he would be a bold man who would deliberately elect to perform the Cæsarean section on such grounds;” and I am happy to answer, that we have had several such bold men, and that they were repaid in a remarkable manner by success. What better trophy could Dr. Meigs, if now living, present, than Mrs. Reybold, with her two children and six grandchildren, as the fruits of his declining, in 1835, to destroy any more children for her? There can be no question now, but that Mrs. R. not only suffered far more in the two craniotomies, and was in more danger afterwards, than from the two operations of Prof. Gibson.

In view of American success in cases of election, we must object to the opinion of Dr. Playfair being applied to American subjects. We do not claim that they are in any greater danger from craniotomy than English women, but do, that by reason of climate and condition, the Cæsarean section is much more promising of success when seasonably made, than in Great Britain. We must claim the privilege of election where we find a deformed pelvis having a conjugate diameter of  $2\frac{1}{4}$ , and in some cases of  $2\frac{1}{2}$  inches, where there has been no opportunity in the proper season for delivery by induced labour. The late Dr. Parry, after having been nearly

<sup>1</sup> Science and Practice of Midwifery, American edition, 1878, p. 502.

seven hours in delivering a woman by craniotomy, who had been thus delivered before, and who narrowly escaped death from peritonitis after his operation, told me that he had determined in case of her being again pregnant, to perform the Cæsarean operation, as more simple, less dangerous, and possessing in addition the important advantage of preserving the child. He unfortunately did not live to put his opinion in practice, and possibly might not have had the opportunity, as the woman in her next labour did not call in competent advice until too late; she was operated upon by craniotomy, and died of blood-poisoning.

*Laparo-Elytrotomy.*—Although Dr. Thomas did not originate the sub-peritoneal substitute for gastro-hysterotomy, the credit of opening the vagina by laceration to avoid hemorrhage belongs to him. He would have us believe that this mode of delivery is infinitely safer than the Cæsarean section, which, for one, I am not at all inclined to credit. I admit that it would appear to be much safer in cases of prolonged labour, in which it is dangerous to incise the uterus; but do not believe that it will prove to be any less dangerous than the Cæsarean operation performed as it should be, early on the first day of labour. Gastro-hysterotomy is an operation of a very duplex character; as a timely method of delivery, it has a mortality of 25 to 30 per cent.; and as one of "the last resort," the deaths very far outnumber the recoveries, having been six to one in New York City. The record of the last ten years shows that Dr. Thomas's substitute is a much needed one in many of our large cities, where the poor deformed victims of rickets are so apt to begin their labours in charge of some ignorant midwife or third-rate accoucheur. In such cases we should recommend Dr. Thomas's operation, so as to avoid the risk of opening the uterus by incision. This operation will no doubt be tested at home and abroad in a few years, and we can then learn its relative safety when brought into comparison with the Cæsarean section performed in the early hours of labor. If rickety women will go to ignorant midwives, then we should give them the advantage of Dr. Thomas's improvement on Ritgen's operation.

From the way in which statistics have been drawn up, by grouping all the cases together, and then taking the general average, the Cæsarean operation is credited with a mortality of 56 per cent., or thereabouts, as with us in the record presented. But this by no means represents the danger of the operation *per se*, as shown by a series of properly conducted cases, many of the balance being either exhausted, *in extremis*, or moribund at the time of the operation, as stated by their reporters. Dr. Playfair, in his *Midwifery*, very justly remarks: "Until we are in possession of a sufficient number of cases performed under conditions showing that the result is obviously due to the operation, in which it was undertaken at an early period of labour, and performed with a reasonable amount of care, it is obviously impossible to arrive at any reliable conclusions as to the

mortality of the operation." Kayser estimates the mortality from second operations on the same women at 29 per cent.; in the United States it has been 25, or 2 women lost out of 8. The two lost were both in bad health, and one almost hopelessly diseased; hence their death. One-fifth of the operations in the United States were performed after from 2 to 15 hours of labour, and 3 out of 4 women were saved (15 out of 20), with 18 children.

*Records according to States.*—Louisiana presents several cases prior to the operation having been done in any other State. Her oldest living operator is Dr. Thomas Cottman, who has twice made the section with success, the first in 1832. Ohio stands second on the list, her first case a success, in 1827; Virginia is the third in order, in 1828; next Pennsylvania, in 1832, the operator, Dr. James S. Dougal, having lived until a few months ago; then Tennessee, in 1837, the operator, Dr. John Travis, I believe, being still alive; then New York, in 1838, operator, Dr. Richard K. Hoffman, etc. *Louisiana* presents probably the most remarkable record of any country, 18 operations, 14 women and 10 children saved. Half of the cases had never been published. 3 women were operated upon twice, and all recovered, five of the children being delivered living. *New York* comes next in numbers; 13, but a great contrast to Louisiana—11 women lost, and 9 children; nearly all the women exhausted, or *in extremis*, before the operation. *Pennsylvania* has had 9 cases, with 4 recoveries, and 5 children saved. Four cases were dwarfs, three saved. *Alabama* has the same number as Pennsylvania, viz., 9, the oldest case (1848) having been received last, and quite recently; operator, the late Dr. William M. Boling, of Montgomery. Women, 8 black and 1 white; 6 blacks died, and the white woman recovered; 3 children delivered alive, and one soon died. Not a very flattering record for the ethnical theory, in favor of the African race being better subjects than the white for this operation. Compare with *Ohio*—8 women operated upon, all whites, two of them small dwarfs, 6 recovered, and 5 children delivered alive. *Virginia* reports 7 operations—5 blacks, one lived—2 whites, one lived; 3 children delivered alive. *Mississippi* presents a record of six cases, three operations on the same woman, who died after the third; all the others died; no whites operated on; 6 children delivered alive, and one dead; one had twins living, an extra-uterine, and intra-uterine fœtus. As an offset against this record, *Indiana* reports six operations, on five whites and one black; of whom only the black and one white recovered. Two children were saved, whose mothers died, and the balance were lost.

Of the remaining States, Michigan and Missouri have each had 3 cases; Arkansas, California, Connecticut, North Carolina, and Wisconsin, each 2; Georgia, Iowa, Kentucky, Maine, Maryland, Massachusetts, Tennessee, and South Carolina, each 1.

*Concluding remarks.*—I think it will be admitted that I have made a



critical analysis of the one hundred cases, such as they were reported. Had they been perfectly presented to me in all points, I could have been more decided in some of my calculations, but there were deficiencies here and there which could not be filled up, although many in the published cases were supplied by correspondence. I should like to have had the age of every case, the *exact* time in labour, the pulse and temperature before the operation, and after it, etc.; but there were many gaps or unsatisfactory statements, although nothing very vital was omitted. The colour of the woman, and result to her and child after the operation, were always directly or indirectly reported. A want of definiteness is too common in such records, "a few hours," "long and tedious," and "several days" being used instead of exact numbers, which would be much more satisfactory when life often depends upon a measure of time.

My attention was attracted some years ago to the study of the Cæsarean operation in our own country, by the remarkably favourable results that had followed in some cases with which I was familiar, and the directly opposite termination of the section in others. This led to the examination of the causes of this difference, and the formation of an opinion which has grown stronger by investigation, and has stood the test of a careful examination of the whole American record. My researches taught me that we were greatly in error in the United States in the management of cases of extreme pelvic deformity; were too much afraid of the Cæsarean section; followed too much the teachings of English obstetrical books, whose opinions are based upon the statistics of Great Britain; added largely to the fatality of the operation by delay; and did not regard or know the value of the instruction to be derived from the records of a number of timely and successful operations that had been performed in our own land. It is very natural that I should wish these facts to be disseminated, as we are dealing with a humane subject, and many lives may in future depend upon the truth being known, as to the relative value to the mother and child, of a *very early*, a *moderately late*, and a *very late* Cæsarean operation.

A very early operation in the United States will save about three out of four women, and as many children; a moderately late one will lose about two out of three women, and one-half of the children (this calculation is based upon the results of the cases of 15 women, who were in labour from 18 to 44 hours); and a very late operation, that is from two to fifteen days or more, after the commencement of labour, will lose three, four, or five to one, according to circumstances. Judging from the fact that delays are unaccountably made by accoucheurs, in cases where the operation would seem to be inevitable, we must, if charitable, believe that they cannot know the value that even an hour lost may be to the woman and child.

Dr. Thomas Radford was kind enough to send me several years ago his records of the Cæsarean operation in Great Britain and Ireland, which I

have a number of times examined, but never so critically as of late. These show a very mysterious difference in relative mortality as compared with our own work. There were 20 operations in cases where the labour lasted from 5 to 18 hours, and but 4 women were saved, although but 4 children were lost. In the United States we should expect to save from 60 to 70 per cent. of both. In these twenty, we find three cases of rickets, nine of mollities ossium, two of exostosis of sacrum, two of epithelioma of the cervix, one of cancer of the rectum, one of fibrous tumour of the pelvis, and one of medullary tumour. The two women with exostosis recovered, and also one having mollities ossium, and one epithelioma of the cervix.

There is something marvellous about this rate of mortality in timely British operations, as the advantage is but a small percentage over the general run of cases, or as one death in five women to one in  $6\frac{2}{3}$ . By extending the limit of time in labour to twenty-four hours, I find in the same tables 25 operations, with 6 women and 19 children saved, an equivalent of 24 and 76 per cent. as compared with 16 and 57 in the general average. With twenty-five operations under the twenty-four hour limit in our country, we should expect to save from 50 to 60 per cent. of both mothers and children. So it will be seen that the results of gastro-hysterotomy are quite different in the two countries. We often hear the mortality of the operation in England attributed to delay, which we see is justly chargeable with only a fractional difference. If all the operations in the two countries were to take place during the first twelve hours of labour, I should expect the result to show less than five women saved in Great Britain for ten in the United States, and the proportion of children to be about the same, or 75 to 80 per cent. in each country.

What makes this difference? We cannot account for it, as I have shown, by delay. We might attribute it to the existence and prevalence of *mollities ossium* as a cause of difficulty, but for the fact that cases of rickets do not seem to have done any better, and that one-fourth of the saved women were affected with cancer. It cannot, then, be, except, perhaps to a very small degree, dependent upon differences of disease. But three causes remain: 1. Difference of skill; we claim nothing here. 2. Difference of climate; we have certainly the advantage of dryness. 3. Difference of habits; here is probably one great basis of advantage, for we have no beer-drinking female peasantry, as in England, to be the subjects of the operation. But then again look at the results in ovariectomy under Spencer Wells, Keith, etc., which are not inferior to our own. This may perhaps be accounted for on the differences of social position between the great majority of the subjects of the two operations, the Cæsarean operation being almost entirely confined to women of the lowest classes, who, by poverty of living, have become the subjects of deformity of the pelvis, either in childhood or adult life. Dampness of climate, extreme poverty,

and beer-drinking appear, then, to be the only assignable causes for the difference of results to the women of the two countries.

The opinion of London obstetricians, based upon the results of their Cæsarean cases, is decidedly hostile to and condemnatory of the operation, and is highly in favour of the cephalotribe, which is not to be wondered at, for under similar circumstances we should be tempted to hold the same views. The few who are in opposition are inclined to condemn the use of the cephalotribe as dangerous, and to defend the Cæsarean operation because it generally saves the child, who is entitled to its life; and although not favourable to the life of the mother, does save a small fractional percentage, which care and promptness might increase under favourable hygienic treatment and the avoidance of stimulants.

*The Operation.*—Although I shall not attempt to describe the steps of the operation, there are points to which it may be well to call special attention, in view of the teachings of the past.

1. The nearer the abdominal incision is made to the central line of the linea alba, the less will be the hemorrhage.

2. The earlier the operation, the better for the safety of the mother and child.

3. Chloroform, by leading to uterine inertia, and vomiting, is an unsafe anæsthetic. Local anæsthesia by spraying the line to be incised is safer.

4. The best sulphuric ether is a safer anæsthetic than chloroform.

5. In the days before the use of anæsthetics, the Cæsarean operation was safer than now, as there were no secondary anæsthetic effects.

6. The operation is not very painful after the skin has been incised; this is painful, and feels like burning with a hot wire. The stitching is the most severe.

7. To arrest uterine hemorrhage and prevent its return, suture the uterus with silver wire stitches.

8. Ice is a good remedy for exciting uterine contraction, and much safer than the persulphate or perchloride of iron. Vinegar is also a valuable excitant, and acts promptly. Ergot is a good preparative to avoid inertia.

9. The abdomen should be thoroughly cleared of all the blood and amniotic fluid which have escaped from the uterus during the operation.

10. Septic poisoning is apt to originate in the decomposition of matters that have escaped from the uterus, even when in small quantity.

11. Many women lose their lives through post-partum uterine relaxation ending in hemorrhage. To avoid this, operate very early and without anæsthesia. In all late cases, suture the uterus with silver wire for safety.

12. Where the uterine drainage is not good, leave the lower part of the abdominal wound open, and syringe out the abdominal cavity with dilute

liq. sodæ chlorinat. f3ij to Oj, or bromo-chloralum one part to forty or fifty of warm water, daily.

13. Never use catgut for uterine sutures; as the knots become untied, the wound opens, and patient dies.

14. If the temperature of the room is high, the wound may be kept open until the uterus is safely contracted, all bleeding arrested, and parts cleansed. In one case the wound was not closed for an hour, and the patient recovered.

15. If the fœtus is dead and putrid, sponge out the uterus carefully and put five or six sutures in it. It is safer to do this than run the risk of secondary hemorrhage or escape of lochia into the peritoneal cavity. Two women, seven and ten days in labour, were thus saved in the United States, and are now alive and well.

713 LOCUST STREET, PHILADELPHIA, NOV. 15, 1878.

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#### ARTICLE IV.

ON THE TREATMENT OF MORBUS COXARIUS BY A NEW METHOD OF EXTENSION; THE PHYSIOLOGICAL METHOD, WITH CASES. By JOSEPH C. HUTCHISON, M.D., Surgeon to the Brooklyn (New York) City Hospital, Surgeon-in-Chief to the Brooklyn Orthopædic Infirmary, etc.

I PROPOSE in this paper to describe a plan for the mechanical treatment of morbus coxarius, which I have practised for some time past, and have found to be simple, efficient, and comfortable to the patient. Whether it is better than the methods hitherto used I must leave those to decide who may be induced to resort to it.

It is not necessary for my purpose to consider whether the mechanical appliances that have been used in this country for the last twenty-five years, or the more recently devised apparatus of Thomas, of Liverpool, accomplish the indications for which they were designed. The point which I wish to make is that they are unnecessary, that they are cumbersome and uncomfortable, and should therefore be abandoned, provided that equally good results can be obtained by simpler means. The indications for the treatment of morbus coxarius, as I understand them, are (1) to secure immobility of the joint; (2) to procure extension of the limb; (3) to take off from it the superincumbent weight of the body; (4) to provide means to enable the patient to take exercise in the open air.

*To secure immobility of the joint no apparatus is necessary.*

Fixation of the joint is one of the earliest and most characteristic symptoms of morbus coxarius. This is secured by reflex contraction of the peri-articular muscles, aided by intra-capsular effusion, and the voluntary

effort of the patient to keep the joint at rest, on account of the pain which motion produces. The rigidity of the joint is so great that when we move the limb the pelvis moves with it—there is apparent ankylosis. This continues until nature says immobility is no longer necessary; but, so long as it is necessary, she secures it better than we can by any artificial appliances. Therefore I desire to emphasize the statement that no apparatus is needed, and whatever artificial appliances for fixation may be added simply tend to increase the discomfort of the patient. Gradually, as the inflammation subsides, the muscles become relaxed and motion returns, provided it is not interfered with by a retentive apparatus, and ankylosis is prevented except in cases of extensive destruction of the joint structures, in which case a cure by ankylosis is the thing to be desired.

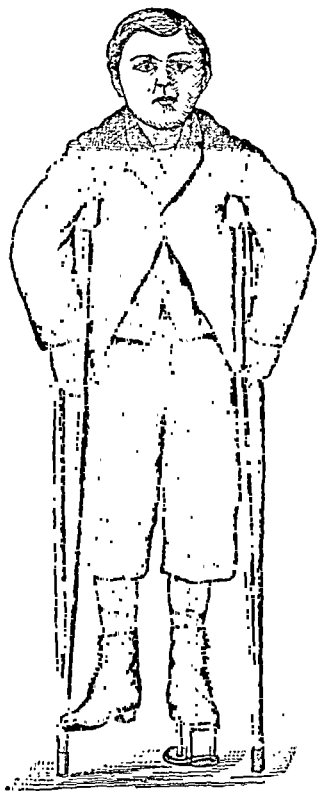
The “American idea,” as our English friends express it, is to apply a splint which allows mobility with extension. Now, I cannot understand why motion should be desirable in the treatment of inflammation of the hip-joint, when we consider it important to secure immobility in inflammation of all other joints. But the “American idea” goes still further; we must not only have motion with extension, but motion without friction. Now, with all due respect, this seems to me to be a mechanical absurdity; because the tissues covering the joint surfaces are swollen by inflammatory deposits, and the opposing surfaces must rub against each other when moved. We might with equal propriety speak of sound without vibration of the air. Why is it, then, it may be asked, that so much improvement has been reported from the American plan when compared with others not having these features? For my own part, I am in the habit of explaining these favourable results by the fact that the use of instruments devised by American ingenuity has liberated patients from in-door constraint and enabled them to live and move and exercise in the open air, instead of being treated in bed as was formerly done.

*To obtain extension of the limb no apparatus is required.*

By means of extension we (1) relieve the pain in the part, not by separating the inflamed articular surfaces as has been claimed, for we cannot separate them to an appreciable extent by any amount of extension that can be applied, but the relief comes from subduing the spasm of the muscles which crowd the head of the bone into the inflamed acetabulum; this is the chief cause of the pain that the patient experiences. (2) It corrects the malposition of the limb, whatever it may be, and prevents the deformity which would otherwise occur from contraction of the muscles or partial dislocation of the head of the bone. We all know how promptly spasm of the muscles of the extremities, in cases of cholera or from other causes, is overcome by forcible extension. I have never in any case of hip-joint disease found it necessary to divide contracted muscles, and I believe the only good to be accomplished by it is that in some cases it would enable us to remove the deformity sooner.

*To remove the weight of the body from the limb and to adopt some expedient that will allow the patient to get the benefit of open-air exercise, are both so evidently necessary as to require no special consideration.*

Fig. 1.



To accomplish the above indication, I have used exclusively for the last eighteen months the mechanical appliances which are shown in the drawing. To the shoe of the sound limb a steel plate corresponding to the sole of the shoe is attached by two or three upright rods, two and a half or three inches in length, so as to raise the foot from the ground; it is the shoe ordinarily used for shortened leg. This elevated shoe and a pair of crutches constitute the apparatus. As the patient stands on his crutches, the diseased limb is suspended. The shoe

Fig. 2.



should be high enough to prevent the toes of the affected limb from touching the ground, and the sole should be covered with leather to avoid noise when walking.

By these simple appliances we fulfil all the indications for the mechanical treatment of hip-joint disease. Immobility is obtained and friction prevented in the manner already indicated—chiefly by rigidity of the peri-articular muscles; extension made by the weight of the suspended limb, which is greater than the weight ordinarily employed for extension, is quite sufficient to relieve the inflamed parts from pressure and pain, and to overcome the deformity of the limb, even though it be considerable; the weight of the body is removed from the diseased joint, and the patient can enjoy all the benefits of open-air exercise.

It seems to me probable that the method of extension here described is both more efficient and more agreeable to the parts concerned, by reason of being more gradual, equable, less arbitrary and constraining, and therefore exciting a less degree of reflex resistance than most other methods. There is a certain degree of instinctive, unconscious recoil in

the mind of every patient, young or old, against all the various devices of constraint or imprisonment which a splint or apparatus implies.

This plan of treatment should be adopted at once, whatever the stage of the disease, and continued until the cure is completed, except in the comparatively rare form of arthritic coxalgia, where acute inflammation of the synovial membrane and other soft structures of the joint is suddenly developed, attended with great constitutional disturbance and excruciating pain, increased by the slightest movement of the limb or the shaking of the bed. In such cases it would be inappropriate at first. Until after the acute symptoms have subsided they should be treated in bed with the long splint and the weight and pulley, together with other appropriate remedies.

There may be cases in which it will be necessary to make extension at night, by the weight and pulley, to relieve the usual nocturnal pain, while the elevated shoe and crutches are used during the day, but I have not thus far met with any, even among those who had used the night-extension with some portative apparatus during the day, up to the time they came under my treatment.

The patient soon learns that relief from pain is obtained by suspending the diseased limb, and then he is glad to walk or stand on the crutches three or four times daily. This appears to be sufficient to relax the muscles to such a degree that spasmodic contraction with the accompanying pain does not take place at night.

For children who are too young, and older persons who are too feeble to use common crutches, Darrach's wheeled crutch, or the ordinary go-cart, are admirable aids to locomotion. Darrach's crutch is the best, as it is so constructed that the patient may be partially suspended in the crutch, if necessary, by a perineal band which prevents fatigue, and it is also lighter and more elegant in its construction. The elevated shoe should be used with either instrument. If a case comes under treatment at so advanced a stage that resection is necessary, the elevated shoe and crutches should be used after the active symptoms following the operation have subsided, instead of adopting the usual practice of confining the patient to bed and using the weight and pulley.

To illustrate the efficiency of the treatment I have described, I submit a few of the cases that have been subjected to it, mostly from the records of the Orthopædic Dispensary under my supervision.

CASE I. *Morbus Coxarius (second stage), treated by the Elevated Shoe and Crutches; Perfect Recovery.*—Ed. W., aged six years, a well-formed boy with good antecedents, was referred to me by Dr. George W. Baker, of this city. I saw him first July 3d, 1877, and obtained the following history: He fell from a sleigh seven months ago, and struck on his left hip. Soon afterwards he had pain in the hip and knee, growing more severe at night. He had been in bed two weeks, with his thigh and leg flexed, and his mother noticed that whenever the limb was abducted

during sleep, he was instantly awakened by pain. After two weeks in bed, the pain having diminished, he went about the house limping.

When he came under my observation, he had pain in the knee, shooting upward towards the hip, growing much worse at night and when the weather was damp. The limb was abducted and apparently lengthened, the foot everted, the leg slightly flexed upon the thigh, and the thigh upon the trunk, partial obliteration of the gluteo-femoral fold; the peri-articular muscles were rigid, so that an attempt to move the joint moved the pelvis with it, as if ankylosis existed at the joint; striking the heel and the trochanter major increased the pain in the joint, and, when laid upon the floor, the effort to bring the popliteal space in contact with it produced a marked curve in the lumbar vertebræ. In short, he presented the symptoms of the second stage of morbus coxarius in a marked degree. He was ordered the elevated shoe and crutches, with open-air exercise and a proper regimen.

At the end of a fortnight the pain had diminished, his aspect had improved, and he bore pressure over the trochanter much better. I saw him from time to time, and noticed a steady improvement.

*March 6, 1878.* He has had no pain for a long time; all the motions of the joint are as perfect in one leg as in the other, except that the diseased leg cannot be so completely flexed upon the trunk as the well one. As a precautionary measure he was directed to continue the use of the elevated shoe and crutches for the present.

*July 4.* The treatment was begun one year ago. Two or three weeks since he dispensed with shoe and crutches by my direction. All the motions of the joint are perfect and painless; he walks as well as he ever did; no pain developed on pressure about the hip, slight atrophy of the limb, no deformity; is well nourished, bright, and cheerful, and, as a pugilist, holds his own with any boy of his age in the neighbourhood. I present this case as an example of the best cure of hip-joint disease I have ever seen.

*CASE II. Morbus Coxarius (third stage), treated by the Elevated Shoe and Crutches; Complete Recovery.* Reported by A. R. PAINE, M.D.—Richard V., aged six years, was brought to the Brooklyn Orthopædic Infirmary for treatment, Feb. 12, 1878. His mother stated that about one year ago he fell down stairs, striking on his left hip. Disease in the joint soon followed, for which he was treated by electricity, and wore a modification of Davis's splint. The limb is now adducted, slightly flexed at the hip-joint, and the foot is inverted, resting with the hall upon the opposite instep; the gluteo-femoral fold is obliterated; there is considerable pain in the hip, increased by pressure over the trochanter, great pain in the knee and swelling behind the joint. He is also very anæmic.

Davis's apparatus was discontinued; he was directed to use an elevated shoe, two and three-fourths inches in height, and crutches, and to be in the open air at least three or four hours daily. He was also ordered cod-liver oil and iron.

*March 12.* He has been much more comfortable since the elevated shoe and crutches were substituted for the apparatus previously used. His appearance has improved, and he has no pain. His mother has continued to use Davis's apparatus at night, lest the nocturnal pains might return. She was told that it was unnecessary, and directed to discontinue it.

*April 5.* His general health is very good; no pain even when considerable flexion and rotation are made. His mother left off the night appa-



ratus as directed; says that he has no nocturnal pain, and sleeps as well without the apparatus as he did with it.

*Oct. 29.* The position of the limb and foot is perfectly normal, no shortening; the joint moves freely in all directions without pain; the most careful examination shows no evidence of disease, and he looks and feels well. He is directed to continue the use of the elevated shoe and crutches for some time longer, as a precautionary measure, although I now consider the case one of perfect recovery. He has been under treatment at the infirmary only eight months.

*CASE III. Morbus Coxarius (third stage); Marked Improvement by the use of the Elevated Shoe and Crutches.* Reported by A. R. PAINE, M.D.—John M., aged 7 years, came to the Brooklyn Orthopædic Infirmary for treatment Oct. 9th, 1877. Eight months since he was struck on the right hip by the sharp point of a boy's sled while coasting, and soon afterwards had considerable swelling and pain in the injured part. He was treated with liniments by a medical man who did not recognize the disease.

When he presented himself for treatment, he complained of great pain in the hip and knee, especially at night. The thigh was slightly flexed on the trunk, and the leg on the thigh, the limb was adducted and the foot inverted; there was considerable swelling about the hip-joint and gluteal region, with marked tenderness, and deep fluctuation was detected over the posterior part of the joint. The slightest effort to move the joint produced great pain; he had a cachectic look, but no hereditary taint was discoverable. A splint made of hatter's felt was accurately adapted to the hip, extending below the knee for the purpose of fixing the diseased joint, and he was directed to walk with crutches.

*Oct. 24.* The symptoms continuing, the pain especially being very severe, a shoe, elevated two and a half inches, was to-day put upon the sound foot, and he was directed to continue the use of crutches.

*Feb. 5, 1878.* His general health has greatly improved; the pain is very much less; swelling in gluteal region more pointed and tender, and there is distinct fluctuation; uses the shoe with great comfort and convenience.

*March 25.* Aspirated abscess in gluteal region, and removed a small quantity of pus.

*May 1.* The boy looks and feels well; slight discharge from the abscess; swelling disappeared; no pain either in the hip or knee; position of leg and foot normal; slight motion in the joint without pain.

*Oct. 1.* His general health, as well as the local disease, has gradually improved until this time. To-day he fell and struck upon the diseased hip injuring himself seriously, and on the 29th of October an abscess, the result of the fall, had formed in the groin, and was discharging freely, but he had no pain, and the position of the foot and leg was normal. The case is still under treatment.

Notwithstanding the unpromising nature of this case, on account of the advanced stage at which it came under treatment, the improvement has been greater than I have observed in any similar case in the same length of time. It was impossible for him to have worn any kind of portative apparatus on the diseased limb, and the only alternative would have been confinement to bed with the weight and pulley to prevent deformity and pain, deprived of the benefits of open air exercise, so important in the

treatment of this class of cases. And despite the grave character the case assumed after the second injury, I think there is great reason to hope that, with the use of the elevated shoe and crutches, without which he could not get out of doors, and with a proper regimen, he will yet recover without resection, and with little or no deformity.

The advantages which the mechanical treatment here described possesses over that commonly employed in the management of hip-joint disease are—

1. It saves the surgeon the trouble and annoyance of applying and carefully watching the instruments in ordinary use, to see that proper extension is kept up and undue pressure prevented, while the patient's comfort is greatly promoted by dispensing with adhesive plasters which irritate the skin and require removal from time to time, and also with the perineal band, which is a constant source of discomfort.

2. The spasmodic contraction of the peri-articular muscles is overcome by the gentle, persuasive, and painless (physiological) extension made by the weight of the limb for several hours each day, whilst forcible extension, either by the ordinary portative instruments, or by the weight and pulley, irritates the muscles and stimulates them to resistance and contraction, which must be overcome by main force.

3. I am quite confident, judging from the experience thus far obtained, that the plan of managing coxalgia herein described, will shorten its duration more decidedly than can be done by the older methods of treatment.

4. The apparatus (if so simple a thing deserves the name of apparatus) is inexpensive, and can be made by any ordinary mechanic.

I may add, in conclusion, that I hope at some future time to publish my experience with the method of extension here described in the treatment of inflammation of the knee and ankle-joints, to which it is quite as applicable as to diseases of the hip-joint.

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#### ARTICLE V.

LATE HEREDITARY SYPHILIS.<sup>1</sup> By I. EDMONSON ATKINSON, M.D.,  
Physician to the Baltimore Special Dispensary.

M. B., white, sixteen years old, and born in Baltimore, was brought to my office by my friend, Dr. Samuel Theobald, to whom she had applied for treatment for her eyes May 27, 1878. She is of medium height, of slender frame, and well proportioned. Her complexion is fair, eyes blue, and hair light in colour. Her parents are both living, and she has a brother and sister, the former four years older, the latter two years younger than herself. She menstruated for the first time last fall, and

<sup>1</sup> Read before the Baltimore Clinical Society, Nov. 1, 1878.

has been regular ever since. Until her ninth year she was rather delicate, but thinks her health was moderately good (as also does her mother, who accompanied her). Her most severe illness up to that time was an attack of measles during her seventh year. During her ninth year she was first troubled with sore throat, which became so severe that she was obliged to leave school. For this she was treated by a physician, who applied caustics to her throat, and used other remedies. In spite of this, however, it was only after several years that this trouble yielded. Somewhat more than two years ago, she had soreness and ulceration of the roof of her mouth, and at this time some small pieces of bone were discharged from her mouth, and came, as she says, from her hard palate. She does not know when this got well. Two years ago a pimple appeared upon the left side of the upper lip, just under the ala of the nose. At the end of two weeks, and when no larger than a split pea and covered with a scab, this was cauterized by her physician. After this, ulceration proceeded with great rapidity, and extended towards the left ala nasi, which soon became invaded, as likewise the nasal septum. The tip of the nose was next involved, and in a short time the ulcer covered the other side of the nose and both cheeks. During this time the disease spread continuously, and no new foci of ulceration were developed. As well as she can recollect, at no time have there been papules or tubercles around the edges of the ulceration. At the end of a year the nasal septum had been entirely destroyed, and small pieces of bone were discharged from the nasal cavity. Cicatrization had begun previous to last summer, and before the autumn was complete over the nose and left cheek. While cicatrization was occurring in these parts, there was steady but irregular extension of the ulceration in other parts of the face. During the past winter the lids of both eyes became involved, and the forehead has been invaded only during the past few weeks. Many remedies have been employed, all, she thinks, without benefit, except the white precipitate ointment, which she has been using since last fall at the instance of a friend.

Her present condition is as follows, viz., the entire face from just in front of both ears, extending superiorly to the lower half of the forehead and inferiorly to a point below the chin, is occupied by a circular surface, made up of areas of ulceration and of scar tissue, the latter covering the cheeks and nose, and forming more or less irregular bands and rugosities. The nasal bones preserve to a great extent the normal shape of the upper portion of the nose, but the alæ are almost completely flattened to the level of the cheeks; the nostrils have been replaced by two very minute holes, hardly large enough to admit pin heads, and almost useless in the respiratory act. The mouth is distorted, and its orifice narrowed. To the right of the chin is an ulcerating surface, said to be of about six months' duration; this surface is bounded externally very sharply from the healthy skin by a ridge of granulating tissue. The ulcer itself is red and granulating, but little excavated, and discharging a small amount of thin pus. Several ulcers are here grouped together; the largest one is of irregular outline, and five cm. in diameter; near this are several small oval ulcers. The eyes, which became affected early last winter, the right one first, present a really hideous appearance. The upper and lower lids of both eyes have been extensively destroyed by the ulceration, so that neither eyeball can be covered perfectly. The lids are much thickened, their edges are red, glazed, and raw; the lashes are for the most part absent. The conjunctivæ are swollen and inflamed. Both corneæ are

cloudy, and upon the right one is a small ulcer. The orifices of the lachrymal canals have been obliterated, and the tears trickle over the cheeks.

Upon the forehead, arranged in a semicircle, just above the nose, are four small ulcers, the lowest one as large as a split pea, red, granular, and excavated, the others causing a slight prominence of the skin, and quite small. These are separated by areas of healthy skin, and have appeared only within the month. Outside of the well-defined margin of cicatricial tissue upon the cheeks, there are no morbid conditions; the same may be said of the ulcers near the chin. Nowhere are there papules or tubercles present. There is some enlargement of the submaxillary glands, which sometimes become tender, but have never suppurated.

Examination of the buccal cavity shows cicatricial tissue extending over the hard palate, which is deeply arched. Just behind the upper middle incisors is a deep pit in the bone, which is now imperforate, but is doubtless the site of the old loss of substance. Proceeding backwards towards the pharynx, cicatricial bands are everywhere visible. The uvula has been entirely destroyed, and the anterior pillars are adherent to the posterior wall of the pharynx. At present there is no ulceration in these parts. The central upper incisor teeth are perfect, but there is some irregularity in the arrangement of the other incisors. None of the teeth are peg-shaped. The conformation of the head is not suggestive of abnormal conditions. Ulceration has destroyed all other specific modifications of the physiognomy, if, indeed, any ever existed.

The general health of the patient is now pretty good; and her mother says that with the exception of the attack of measles she has had no other cutaneous eruptions than those noted; neither have there been periosteal thickenings, or rheumatoid pains, nor are there other scars of lesions upon other parts of her body. Her urine is free from albumen and tube casts.

Her mother has never miscarried, and has two other children—a son four years older than my patient, who is said to be perfectly healthy, and a daughter fourteen years old, whom I have seen, and who is apparently perfectly healthy. The mother, however, has around her mouth several circular scars, which she attributes to sores many years ago. The father is subject to an eruption upon his face, which has been called erysipelas, but which gives rise to scars, and which he has had ever since he was in the army during the late war. While in the army he had an extensive ulceration upon his shoulder. He has suffered much from “rheumatism,” and is always ailing and unable to work. (The information concerning the husband and father was obtained from his wife and mother; the man himself has persistently evaded me, and has avoided an examination.) There can be but little doubt, then, that the girl’s father was already during the war the victim of somewhat advanced syphilis.

From the statements of the patient and her mother, it seems probable that her lesions had been treated by her physicians as manifestations of lupus; at all events, there was no history of the administration of mercury or of iodine; but, upon the other hand, frequent cauterizations had been employed. (It will be remembered that the white precipitate ointment, which had been used for some months, had been recommended by a non-professional person.) There could, evidently, be here only the question of syphilis or of lupus in the formation of a diagnosis. From the fore-

going description it will be at once remarked that the lesions presented were strongly suggestive of lupus; the superficiality of the ulceration, its red and but slightly secreting surface, more closely resemble lupus than syphilis.

Upon the other hand, there was the history of a very much more rapid ulceration than is observable in lupus, the face being almost entirely invaded within two years after the appearance of the tubercle upon the upper lip; again, the cutaneous ulceration was preceded by a pharyngeal ulceration, which had begun five years previously, a pathological succession not observed in lupus, since the lupous affections of the mouth and fauces are only met with "in association with cutaneous lupus, either as a direct continuation from the skin of the cheeks and lips, or independently." (Kaposi, *Hebra, Dis. of Skin*, New Sydenham Society's Translation, vol. iv. p. 70.) Another important point of difference was the destruction of bony tissue in this young woman, both of the hard palate and of the nasal cavity. Destruction of bone is certainly a rare occurrence in lupus. Kaposi does not recollect to have seen "secondary inflammation of the submucous tissue ending in caries or necrosis of the bones of the hard palate, and perforation extending through into the cavity of the nose, nor necrosis of the vomer in consequence of lupus of the mucous membrane of the nose."

There was, furthermore, the history of suspicious ulcers upon the mother's face, and the clear history of symptoms in the father, dating back many years, and almost without doubt due to syphilis.

Actuated by these considerations, I formed a diagnosis of syphilitic ulceration; and in view of the early age at which symptoms, usually held to be late manifestations of the disease, exhibited themselves; the absence of other symptoms of the earlier stages; the modified character of the lesions observed, contrasting markedly with the ulceration of the same parts in the acquired disease; and the probably late stage of the disease in the father about the time of her birth, I concluded that these lesions derived their origin from an inherited taint. The correctness of this conclusion will, I think, presently appear.

Acting, then, upon this diagnosis, treatment of an antisymphilitic nature was immediately begun. The white precipitate ointment was ordered to be continued as a local application, and there was ordered a mixture containing 8 grains of potassium iodide with 20 minims of the syrup of the iodide of iron in a tablespoonful of water three times daily. After a week the dose of the iodide was increased to 15 grains, and after this no change in treatment was made until an entire cure had been effected. By June 24th the ulcers upon the forehead were entirely healed, and during the first week in July those upon the lower parts of the face were well. The eyes were much better, although the swelling and loss of substance rendered it impossible to completely close the lids. After this time, considering herself well, she became irregular in her attendance; but when last seen the left eye was very much better, and could be closed by a determined effort; the right eye still remained inflamed with excoriated, thick-

ened lids, not sufficient to cover the eyeball. She was ordered to continue her medicine.

Here, then, was a case where the face was converted into a repulsive scar; where a young woman of sixteen years will be condemned, during the rest of her life, to hide her countenance from her fellow creatures; where a happy future has been rendered absolutely impossible by a malady, whose early recognition would almost certainly have resulted in a prompt and complete arrest, and in the preservation of her features in their integrity. Here, also, the characters of the symptoms might have indicated the nature of the disease, or at least have suggested that *experimentum crucis*, an antisiphilitic treatment.

Under these circumstances it may be worth while to draw attention to some peculiarities of that form of hereditary syphilis denominated "tardy," more especially to the tendency of the disease in this stage to attack the pharynx and fauces, the bones of the hard palate and nasal cavity and the contiguous parts. It is a disputed question whether syphilis *hereditaria tarda* may appear without the patient ever having had, during infancy, any evidences of the disease; whether, in a word, hereditary syphilis may appear for the first time after the period of infancy. There are distinguished authorities who believe that such may be the case. Van Buren and Keyes, *Genito-Urinary Diseases with Syphilis*, page 662, say, "That there may have been some undiscovered symptom in babyhood may be allowed, but still it is as near a certainty as possible, without absolute proof, that a child of a parent whose syphilis has nearly run out, may show no signs of disease until many years after birth, and then the lesion will be of a bone, a joint, a gland, the eye, or perhaps there will be a patch on the mucous membrane of the buccal cavity, an ulcer of the nose resembling lupus, or some other single localized lesion usually passing undiagnosed as far as its etiology is concerned." On the other hand, A. Weil (Ueber den gegenwärtigen Stand der Lehre, von der Vererbung der Syphilis: *Sammlung Klinischer Vorträge*, etc.) declares that the occurrence of inherited syphilis manifesting itself for the first time after years, or at the time of puberty, is just as questionable as the occurrence of tertiary symptoms in acquired syphilis without the previous manifestation of the primary affection, or of that of the secondary period.

Although the literature of late hereditary syphilis is scanty, and the relations of the affection but imperfectly known, there are a number of cases recorded where as far as was discoverable the first symptoms were observed after puberty. Baümle, Weil, and others, however, doubting the possibility of this, call attention to the, occasionally, very insignificant manifestations of infantile hereditary syphilis, and to the great probability of their being overlooked. Naturally, an insignificant lesion is most apt to pass unnoticed or to be forgotten; and the most that can be said at the present time is that *late hereditary syphilis, even of very grave character,*

*may occur in individuals, who, during infancy, suffered from symptoms of their inherited disease, so mild and unimportant as to escape recognition.*

The symptoms of late inherited syphilis usually resemble those of a modified tertiary form of the acquired disease, but have also, undoubtedly, been treated of by many writers, as manifestations of the scrofulous diathesis. It is, however, the opinion of writers of the most experience, that the differences between late hereditary syphilis and scrofula are positive. Hutchinson, for instance, asserts without hesitation that hereditary syphilis "neither predisposes to consumption nor to the ordinary forms of scrofulous and tubercular disease."

It is, however, not my intention to speak of the various lesions of the stage of the disease under discussion, but merely to draw attention to a set of symptoms whose actual presence, or the cicatricial remains of whose former presence in children and young persons not known to be syphilitic, should always arouse the suspicious watchfulness of the medical man. There are usually evidences of past or present disease which are well known, to betray the syphilitic inheritance of certain persons; there may be the peculiar notched upper central permanent incisor teeth, the interstitial keratitis or its vestiges, the flattened bridge of the nose, the linear cicatrices about the mouth, the protuberant forehead. There is also usually the history of syphilis in infancy. All these sources of information may, however, be absent, and we may be obliged to look for other signs to throw light upon our perplexities. When, therefore, a patient who has never had acquired syphilis presents destructive lesions, or their remains, of the pharynx and fauces, of the hard and soft palates, or of the nasal cavity, the probability that he has to do with inherited syphilis should suggest itself to the medical attendant.

A review of the recorded cases of late hereditary syphilis reveals an astonishingly large proportion of lesions of the character just referred to. Lancereaux (*Traité Historique et Pratique de la Syphilis*, Paris, 1873, p. 436), in quoting cases of hereditary syphilis of late development reported by various authors, such as Balling, Trousseau, Fournier, Sperino, Sigmond, Ricord, Bouchut, and others, records a large majority in whom the destructive lesions or their scars implicated the pharynx, the hard and soft palate, and nasal bones. Several of these cases likewise presented destructive ulceration of the face. Cases have also been reported by Laschkewitz (*Vierteljahr. für Dermatologie und Syphilis*, Heft. 2, 1878), Klink (quoted in the same Journal), Zeissl (*Pest. Med. Pr.*, Jan. 1877), Wilks (*Lancet*, Feb. 19, 1876), Lewin (*Wien. Med. Presse*, No. 1, 1876), and others. In a paper read before the Société Nationale de Médecine de Lyon (*Lyon Médicale*, July 16, 1876), M. Dron related fifteen cases of late hereditary syphilis in whom naso-pharyngeal symptoms were the lesions most commonly encountered. Lancereaux declares that he finds himself more and

more disposed to consider those affections described under the name *angina scrofulosa*, purely tardy manifestations of hereditary syphilis. Chaboux (*Certain Lesions of the Naso-pharyngeal Region which should be attributed to Syphilis*, Thèse de Paris, 1875) "concludes that late tertiary syphilis, particularly the hereditary forms in children and adults, is far more common than is generally supposed; that the naso-pharyngeal region is its site of election; that suppurative osteitis of the nasal and palatine bones, with ulceration of the velum, isthmus, and pharynx, as well as certain forms of tubercular lupus, limited to the *alæ nasi* and septum, should not too hastily be attributed to struma" (*Archives of Dermatology*, April, 1878).

Van Buren and Keyes (*Genito-Urinary Diseases and Syphilis*, page 599) remark, "It has been written that scrofula may cause these throat ravages in children; because children are found in whom a syphilitic history or parentage cannot be traced, who have ulcers and other evidences of so-called scrofula and destructive ulceration of the soft palate, perhaps, not so promptly relievable by the iodide of potash as similar fresh conditions in the adult. Yet the iodide of potassium is usually given for these cases, and with benefit."

Zeissl, who believes that in these cases of late hereditary syphilis, the taint is derived from the father, in whom the symptoms of the disease were latent at the time of impregnation, says that the children may be born and remain during their years of infancy apparently healthy, but that gradual gummous infiltrations appear upon the skin (*lupus. syph. hered.*), with accompanying destruction of the soft palate and of the nose (*ozæna syph.*), enlargement of the bones, etc., appearances which, in former times more frequently than at present, were considered manifestations of scrofula (*Lehrbuch der Syphilis* 1871 p. 304).

ulcerative lesions of the pharynx and soft palate, and of the bones of the hard palate and nasal cavity, in persons suffering under the taint of hereditary syphilis; and the practical conclusion to be drawn from this circumstance is, that in all cases involving lesions of these parts where the question of acquired syphilis may be excluded, and even where other signs of inherited syphilis may be wanting, the employment of anti-syphilitic treatment should not be held in reserve as a last resort, but, on the contrary, its prompt and vigorous exhibition should be immediately decided upon and persistently continued, in the strong hope that by so doing, such repulsive deformities as have occurred in my case may be averted, and the patient quickly relieved of an almost interminable source of suffering and mortification.

This treatment may with all the more confidence be resorted to where destructive lesions of the mucous membrane of the parts under discussion have occurred without or previous to cutaneous lesions, and where losses



of bony substance have taken place in the palatal and nasal regions; since lupus, the affection offering the strongest resemblance to the effects of syphilis upon these parts, is only met with in these localities, in association with cutaneous lupus, either as a direct continuation from the skin or independently, and since destruction of osseous tissue by lupus is, to say the least, exceedingly uncommon.

BALTIMORE, 223 Madison Avenue.

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#### ARTICLE VI.

EXCISION OF A LARGE FEMORAL CYST; GENETIC ORIGIN OF SUCH CYSTS FROM CONGENITAL PERITONEAL POUCHES. By MIDDLETON MICHEL, M. D., Prof. of Physiology and Histology in the Medical College of the State of South Carolina, Charleston.

THIS report of a cyst of the thigh of considerable size, which came under my care some years ago, with another exactly similar recently under my observation in the practice of a colleague, is of surgical interest, since there are but few of like character on record. As my special object, however, is to furnish an explanation of the possible origin of these growths, which it appears is involved in such obscurity as to be passed over without reference, or attempted to be accounted for by the vaguest hypotheses, I shall make their probable mode of development the principal topic of remark, without intruding a dissertation on the pathology of cystgenesis, with a tiresome repetition of particulars that are perfectly well understood.

CASE I.—A negro man, aged fifty years, a servant of Mrs. Charlotte K., of this city, came under my professional care many years ago. He presented a cystic tumour of great size, occupying the entire inner portion of the right thigh from below Poupart's ligament to within a few inches of the knee-joint. In circumference the tumour measured around the thigh in its greatest transverse direction about thirty inches, was almost spherical in shape, and presented fluctuation.

It had never been tapped, and had grown slowly from a tumour of the size of a walnut to its then inordinate dimensions. Giving no pain, this tumour became the subject of complaint only when through its size free locomotion was impaired. He was operated upon in the amphitheatre of the medical college in presence of the class. An extensive incision was required which was practised in a longitudinal direction almost parallel to the course of the femoral artery along the inner border of the cyst from Poupart's ligament to within the neighbourhood of the knee-joint.

The isolation of the cyst at its inner, anterior, and outer portions, though requiring careful dissection not to perforate the sac, was easily accomplished; but its adherence at its under part was so intimate with the deeper tissues and sheaths of the vessels and nerves as to constitute the most difficult, perhaps dangerous part of the operation, as it certainly was the most protracted part of the procedure. It rested upon and dipped deeply

between the adductors, and when raised from its bed presented a sort of pedicle, which descended, to all appearance, far into the pelvis. It was at this juncture, while dragging upon the pedicle to discover its connections and directions, that the sac was accidentally opened and a large quantity of dirty serum escaped. The cyst was cut away, no ligature was used around the pedicle, and but few vessels required ligaturing. The finger penetrated to some depth at the site of the pedicle, but revealed nothing. The wound of necessity was very considerable, at the bottom of which the femoral vessels and nerves were seen dissected from the growth throughout their extent. The parts were brought together by sutures, and the proper provision made for drainage. Though sustained by nourishing food, and every care shown him in the ward of the Roper Hospital assigned to such cases as were made the subject of a surgical clinic to the medical class, yet the wound exhibited no disposition to heal by first intention, suppuration was excessive from all parts of the extensive track, welling up especially from the deepest part just beneath the pelvis. Exhausted by the reactionary fever, suppuration, and perhaps shock of the operation, the patient succumbed in fifteen days. No necropsy was made, which I have had occasion to regret ever since.

Unacquainted with any similar cystic growth in this particular situation, I consulted the famous thesis of M. Pardieu, published in 1839, and found that Velpeau, in his unparalleled experience, was credited with two cases of the kind—one of the anterior, another of the exterior part of the thigh; but with no accompanying details nor reference to where such might be found. The first descriptive account of a very similar case to my own came to my notice, not until several years after this operation; this was a large cystic tumour of the thigh, in a boy of fourteen, admitted into University College Hospital February 24, 1856, under Erichsen's care, and published in the *Lancet* for August, 1856. The particulars, so far as they concern this subject, I will here give.

CASE II.—The tumour grew to a great size from a small cyst at the upper and inner part of left thigh in eighteen months; it was tapped and speedily filled again, was injected with tincture of iodine. The boy attributed the rapid growth of this cyst to its present size to friction of the inner aspect of the thigh against the saddle in riding; he suffered no pain. In shape, oval; the cyst extended up to Poupart's ligament as far as the adductor muscles permitted, beneath which it was in part buried, bulging out posteriorly until it appeared as "an enormous additional buttock," situated below the natural one. Standing up, the maximum circumference of the tumour was twenty-five inches—the opposite thigh, on the same level, was seventeen inches. M. Erichsen made an incision seven inches and a half in length along the inner aspect of the thigh, commencing just below the ramus of the pubes. A prolonged dissection separated this growth from its intimate attachments and muscular fibres which reinforced the several layers of thickened fascia by which it was surrounded. "Superiorly, the walls were firmly adherent to the surrounding parts, and blended with them. The cyst was now cut open, and the fluid evacuated. Room being obtained for the introduction of the finger, the cyst was found to run up under the adductor brevis to the pelvis, the ramus of the pubes and the borders of the thyroid foramen being distinctly felt from the inside of the sac. All the walls of the cyst which could be dissected from the surrounding parts were now cut away, and what remained firmly adherent to the muscles was rubbed with caustic potash." This patient died on the second day, and at the *post mortem* "it was found that the cyst lay between the adductor magnus behind, and the adductors longus and brevis and the pectineus in

front. Superiorly it extended up in front of the quadratus lumborum" (femoris?) "and the obturator externus. What remained of the cyst was firmly incorporated and joined with the adductors magnus and brevis; the substance of the former is very much indurated, and the cellular tissue amongst the fibres very much hypertrophied."

It was not again until very recently that I met with another cyst growth in precisely the same position, in the colored ward of the Roper Hospital.

CASE III.—Robert Hicks, a negro boy of about twenty years old, was admitted into the Roper Hospital, May 20, 1876, with a large cyst occupying the right thigh extending from below Poupart's ligament to the middle and inner part of the thigh. It gave no pain, was movable beneath the skin, though firmly adherent at its base, which rested upon the femoral vessels. It had grown in a few years to its present large dimensions, and giving inconvenience during the exercise of the limb, while its cystic character was clearly established, it was determined to remove it by excision. This was done a short time after his admission by Dr. Porcher, through an incision of sufficient length to admit of a free and careful dissection being made, which liberated the cyst from all adjacent parts except again a well-marked pedicle which retained the growth in deep relation with the intermuscular spaces leading beneath the horizontal branch of the pubis towards the sub-pubic or thyroid region. So conspicuously deep did this pedicle run, that it was thought advisable to ligate this part of the cyst before cutting it away. The wound, being sutured, was dressed in the ordinary way, but showing no tendency to heal, injections were made with the permanganate of potash, anodynes and tonics administered, under which treatment some progress was made towards recovery, when he asked for his discharge and left the hospital July 7th, not quite two months after his admission. We learn that he died shortly after this.

Though constantly repeated that cysts may occur in any part of the body, the extreme rarity of their appearance in the thigh is evident from the few cases which seem to be recorded. Mr. Erichsen, in his clinical remarks, observed that he was familiar with a case of the kind in the practice of an eminent surgeon of London,<sup>1</sup> in which a great portion of the cyst was removed and the remainder allowed to suppurate away; and that Mr. Paget had referred to two cases in his work on tumours; one in a woman of twenty-five, which was removed easily, though adherent by a small portion to the front of the pubes; and another in a woman of fifty years, where Mr. Lawrence removed a tumour in an exactly similar part, and both operations were successful. We have already alluded to the two cases belonging to Velpeau; these with Mr. Erichsen's, mine, and Porcher's, make in all eight cystic growths developed in this peculiar manner in this region, with a history, so far as we have been able to obtain any information, strikingly similar.

The problem of origin of this particular kind of cysts has specially occupied my thoughts ever since the first case came within my observation years ago, and the object of detailing my own case now, associated

<sup>1</sup> Lancet, Aug. 1856, p. 215. New York edition.

with that of others of a like kind, has been to account for their development upon anatomical grounds, which, if as correct as apparently plausible, must remove at least this class of cases from the list of cysts of *spontaneous*, *accidental* as Perdieu terms them, or *independent* origin according to Green, in which they are included by all authors. Opinions expressed by pathologists on this subject of origin are purely hypothetical, as they appear to rest upon no accredited example of cystgenesis by the methods proposed. Theories vary accordingly with each writer, and some are of the most imaginative character: for instance, it has been conjectured that a vein may become obliterated at some one point, distension then follows upon the distal side until a sac or cyst is formed, absorption of the contents slowly progresses until nothing but colourless serum remains to fill the thus formed cyst; or transformation is supposed to occur in some vascular tumour, which of course must pre-exist, must precede the formation of the cyst, thus some hystolytic change takes place within a *nævus*, which in turn degenerates into a cyst; a yet more commonly received opinion, which is demonstrable and therefore undoubtedly true as to the production of small cysts, but scarcely applicable to the class of cysts we are describing, is that a sudden extravasation of blood takes place into a part, filling no very great space, which soon must clot, the fibrin at the peripheral portion of the clot *fibrillates*, presents a felt-like appearance, assumes organization, which is the more readily accomplished the smaller the clot, and the closer the peripheral parts to organized and healthy tissues, this organized film of fibrin, traversed by bloodvessels, promptly acquires structure, and thus constitutes an enveloping membrane, which in time becomes the future cyst wall; it has even again been affirmed that adipose tissue itself in intermuscular spaces may under peculiar conditions soften down or liquefy, become absorbed, leaving empty areolar tissue whose intercommunicating cells merge into one vast cyst-like sac, which as it fills with its own secretions presses upon and condenses the connective tissue around it until a firmer sac is formed. This expansion and fusion of spaces in connective tissue has been invoked to explain a number of smaller bursæ and serous cysts forming in all parts of the body.

Another method of accounting for certain congenital indurated muscular tumours, seen occasionally in the sterno-mastoid muscle, supposed sometimes to degenerate into cystoid growths within the belly of the muscle, was proposed by Mr. Thomas Smith in 1870.<sup>1</sup> The suggestion is made that the fibres of the affected muscle are accidentally ruptured, effusion of blood within the muscular sheath takes place, room for which is made by the retraction of the torn fibres. Here, the clot must undergo the changes which I above described, therefore a cyst thus formed does not differ in origin from one produced by extravasation.

<sup>1</sup> Transactions of the Clinical Society of London, vol. iv., 1871.

It may again be said that the general drift of modern hystogeny, from which more reliable because more scientific information is obtained, ascribes these growths, whether solid or cystic, to that all-important factor in most morbid productions—the migratory mobile leucocyte, amœboid, nomadic, or wandering connective-tissue cell; a plausible theory of pathogenesis, which derives all development from pre-existing cellular elements as the fundamental law of hystogeny; since all evolution, whether normal or pathological from a cystoblastema or plastic blastema derived directly from the blood with *free* cell birth, after the Schwannian method of exogenous growth, is unverified and now an exploded theory, notwithstanding such able adherents as a Pouchet or Broca, a Bennett or Bastian. To this, without discussion, let me emphatically state that no one has ever as yet seen, however bright a future may await the theory, a cystoma, fibroma, carcinoma, lipoma, osteoma, or any neoplastic birth spring from either the wandering cell or the yet more stable connective-tissue corpuscle.

Dissentient critics of these unsatisfactory theories have not always substituted less conjectural explanations of the origin of the independent cyst. M. Birkett<sup>1</sup> of Guy's Hospital, for example, in an able paper on the Surgical Pathology of the Sero-sanguinous Cysts in Neck and Axilla, of which he had seen only three, rejects Mr. Paget's doctrine of their origin, yet substitutes for all such hypotheses, his statement: "That this cystiform growth should be regarded as a peculiar development of its own kind and individuality." Some of these speculations, however, we cannot properly reject, so far as they relate to the development of other kinds of cysts, for the progressive steps of growth, in many of these instances, may be actually followed, where, for example, a sebaceous cyst springs from obliteration of a duct, or a sanguineous effusion consequent upon some injury or blow becomes encysted. A cystoma of truly independent origin, bearing no relative affiliation with surrounding tissues, wedded in no respect to neighbouring parts by natural ties of structural identity, would exhibit the development of an outgrowth towards the surface, would scarcely be found to plunge by a deep pedicle towards, perhaps into, the pelvis, and such isolated growths could be cut, scraped, burnt, or injected with very little danger to life; whereas, the kind of cysts we are here describing have all had a prolongation springing significantly from the deepest part of the thigh, and have proved conspicuously dangerous upon being cut, whether the pedicle were tied or left opened, since death has followed in three or four instances. Accidental or independent cysts I am also inclined to think are somewhat limited in size, scarcely if ever attaining the dimensions of such as take birth in some normal vesicle or sac, such as a Graafian follicle which grows without restriction until it acquires the unlimited capacity of an ovarian tumour.

<sup>1</sup> Am. Journ. Med. Sci., April, 1869, p. 468,

Thus it occurred to me, with respect to these growths within the thigh possessing their own cell-wall, lined with epithelium, and presenting a prolongation always directed towards the pelvic cavity, to look for a less remote origin—for one that might be connected with some pre-existing structure, and this, it now appears to me, is to be found in those peritoneal pouches or vaginant folds of peritoneum which Roser, Linhart, and Engel made the subject of anatomical study years ago; which we have elsewhere argued played an important part in the production of hernia,<sup>1</sup> but which have never before been invoked to explain or account for the development of these peculiar femoral cysts.

Now these peritoneal pouches are most common in the inguinal region, but are by no means confined to this locality; associated with defective development of the tendinous fibres about the pelvis, these peritoneal canals may protrude in various directions in and about the thigh, and are the forerunners of hernia in these several directions, though scarcely discoverable until the intestine, or some other organ, as the spleen, kidney, uterus, ovary, or even bladder, by descending reveals the congenital opening. The development of such a pouch or sac need not depend, however, upon any herniated organ; lined by epithelium, and being a part of a vast abdominal serous membrane, the accumulation and retention of serous exhalations at first, and finally of a more abundant serous secretion, would of themselves, under certain circumstances, unfold its saccular character, and in due time the whole growth would undergo such textural changes as are known to occur in every hernial sac, that is to say, the sac would expand, not by borrowing tissue from the adherent abdominal parietal layer of peritoneum, but as an actual extension of the area of the sac itself, associated with progressive thickening of its own structure, so that what was at first no larger than an inguinal gland would gradually enlarge, like an ovarian cyst, to a considerable size. The very thickening of the walls of such a sac, and subsequent progress of growth, insure certain alterations in the funicular portion as will form the neck or pedicle. Augmentation and outgrowth of the sac elongates and puts this funicular portion upon the stretch, until it becomes more or less constricted and corrugated, while at the same time it shares in the general thickening of the entire structure, and in its narrowed precincts by condensation of tissue becomes finally obliterated, cutting off all communication with the peritoneal membrane; all of which is more likely to occur under the continued friction to which the parts are subjected during locomotion, or more especially from any blow or injury.

Without any great effort of imagination, we can easily understand how a cyst is gradually formed just where anatomy shows these congenital serous prolongations to exist, for there can be but little doubt that in some

<sup>1</sup> Charleston Med. Journ. and Rev., Jan. 1876, p. 263, Oct. 1876, p. 182.

such way cysts about the neighbourhood of the testicle are produced; as scrotal cysts, from the *peritoneo-vaginal*, *epididymal* and *testicular* diverticula of the tunica vaginalis.

A cyst thus originating may be found, therefore, isolated completely among the muscles, or perhaps revealing its primitive origin solely by a pedicle dipping deeply down to some one of the openings about the pelvis.

That these peculiar cysts, discovered to be invariably connected with some of the pelvic outlets, originate in one of those vaginal duplications of the peritoneum, which research has shown are frequent in infancy and often through adult life, as congenital embryonal structures, similar to the peritoneal canals in some of the lower animals, seems far more reasonable than to ascribe their source to some wandering leucocyte or connective tissue corpuscle.

These structural points connected with the history of the peritoneum are little known at best, perhaps even to those who most have cultivated the diligently reaped, exhausted field of anatomy, and are therefore of the deepest interest to the comparative anatomist and embryologist; but we have only so far referred to the subject as was immediately connected with the generation of these cysts, so persuaded, so convinced are we of the dependence of these pathological conditions one upon the other, a fact too significantly reiterated in the frequent, we may almost say constant, connection of these cysts with a pelvic pedicle of some sort.<sup>1</sup>

This subject may have already detained some readers too long, though of particular interest to ourselves, believing, as already intimated, that this is the first time that these congenital peritoneal canals of rare occurrence have been thought of in connection direct with the development and true genetic origin of pedunculated femoral cysts.

In conclusion then, at the risk of monotonous iteration, we would enforce our own convictions upon the true student of surgical pathology, that, through his subsequent researches, he may disprove or prove us correct: *that these large femoral cysts, whether pedunculated or isolated, spring from rare congenital funicular or vaginant processes of peritoneum.*

CHARLESTON, S. C., Sept. 30, 1878.

<sup>1</sup> Mr. Paget's two cases of cysts, already referred to, may probably be the same mentioned in his catalogue of the pathological collection in the Museum of the Royal College of Surgeons of England, and if so, it is stated that these large cysts "filled up the thyroid hole, projecting both into the pelvis and the thigh."—*Chelius's Surgery*, vol. iii. p. 432, Philadelphia, 1847.

## ARTICLE VII.

ASTHMATOS CILIARIS.—IS IT A PARASITE, THE CAUSE OF CATARRHAL AFFECTIONS? By JOSEPH LEIDY, M.D., Professor of Anatomy in the University of Pennsylvania.

IN the number of the *Virginia Medical Monthly*, for November, 1878, the leading article is entitled "Rhizopods (*Asthmatos ciliaris*) a Cause of Disease. By Ephraim Cutter, M.D., Boston." According to this communication there exists a parasitic animal, which is the ordinary cause of influenzas, catarrh, hay fever, and the like affections. The discovery of the parasite and its agency in disease are attributed to Dr. J. H. Salisbury, who published a paper on the subject in Hallier's *Zeitschrift*, Jena, 1873. From the original account it would appear that a peculiar animalcule, the *Asthmatos ciliaris*, is the cause of "infusorial catarrh and asthma." The parasite is stated to assume a great variety of shapes and sizes during the different phases of its existence. Descriptions accompanied with figures are given of many of its varieties of form. Its mode of reproduction is described, and it is asserted that from time to time the *Asthmatos* gives birth to living young.

Afterwards follows a description of the catarrhal affection induced by the parasite. In reference to the season of its invasion, Dr. Salisbury remarks, that "when it occurs during the latter part of the summer and early autumn, it is usually called 'hay fever' or 'hay asthma.'" The author regards the affection as contagious. In speaking of the treatment, he says that "the only remedies that do any good are such as either destroy or retard the growth or reproduction of the parasite."

The observations of Dr. Salisbury are confirmed by those of Dr. Cutter, who gives his experience of cases of the disease, and the results of his examinations of the supposed parasites. In some of his researches he was assisted by Prof. Paulus F. Reinsch, of Erlangen, Germany, an able microscopist, who also made drawings of the *Asthmatos*, which accompany the communication. Dr. Cutter defines the position of the *Asthmatos* in the zoological series, and refers it to the class of Rhizopods with close affinity to the sun animalcules or Actinophryans.

In conclusion Dr. Cutter remarks "that there is a parasitic animal found in the secretions of the respiratory tract of persons suffering from influenza, colds, catarrhs, and asthmas." Dr. Salisbury, the discoverer, has observed over 1000 cases; Mr. Daykin reports a case; Dr. Reinsch, two cases in one individual; and the writer has observed about 100 cases." Dr. Cutter adds that "it is supposed to be the cause of the disease named because it is infectious; parasiticides kill it; with its death comes instant relief to the symptoms of the disease; and when carefully looked for, it is found to exist in this class of cases and not in other catarrhs."



The number of the *Virginia Medical Monthly* containing the communication of which the above is a brief notice, came to me while I was actually affected with a catarrh akin to hay fever, similar attacks of which I have had, sometimes during the autumnal season, for many years. Dr. Cutter appeals to the present writer as to the true position of *Asthmatos ciliaris* in the zoological system. From the descriptions and drawings, its characters would assign it to the class of Infusoria and order Ciliata, rather than to the class of Rhizopoda. If it were a distinct animal, according to the classification of Stein, it would be a peritrichous ciliate infusorian.

Is the object named *Asthmatos ciliaris* really an animal parasite? was the question which occurred to me on reading Dr. Cutter's communication. From a copious expectoration of frothy, glairy mucus I placed a portion beneath the microscope with an objective power of  $\frac{1}{10}$  inch. There surely, among a multitude of other cell elements, were many specimens of the *Asthmatos ciliaris*, in lively condition and exhibiting truly "a great variety of shapes and sizes." Some of the specimens were dead, but most of them were in a state of high activity. Though stationary in position, they rocked from side to side, like Chinese idols in motion, while the cilia covering the head waved in a flame-like manner. It was the waving of the cilia which produced the rocking motion of the body.

Many of the *Asthmatos* were round and about the size of the associated mucus corpuscles, with cilia crowning rather less than half their extent, as represented in Figs. 1, 2. Others were reniform, with the cilia springing from the concave side, as seen in Figs. 3, 4. Larger ones were round, oval, or ovate, as seen in Figs. 5, 6, 7; and still larger ones were biscuit-shaped, as in Fig. 8, or gregarina-like, as in Figs. 9, 10. Others presented more or less irregular modifications of the common form of the columnar ciliated cells of the air passages, as seen in Figs. 11-15.

Many of the ciliated bodies appeared without a nucleus; others presented a pale granular globular nucleus, and occasionally one would present two such nuclei; in others the nucleus was larger and oval and provided with a nucleolus. Some of the ciliated bodies contained small pinkish vacuoles, variable in number and quite passive. There were other cells associated with the ciliated ones of the same forms, but without the cilia, as if these had been removed, as seen in Figs. 16, 17.

Though very unlike the normal ciliated epithelial cells of the pulmonary air-passages, and certainly bearing resemblance to some of the peritrichous ciliate infusorians, my interpretation of these bodies has always been that they were incomplete or deformed ciliated epithelial cells. I say has always been, for I have previously and repeatedly observed the same bodies, and it never crossed my mind that they were anything else than ciliated epithelial cells more or less modified by the condition of the catarrhal affection. With the subsidence of the catarrh, the desquamated

ciliated epithelial cells diminish in number in the expectorated mucus and finally disappear, as if they had ceased to be thrown off from the mucous membrane.

The expectorated catarrhal mucus ordinarily contains a multitude of cell elements presenting considerable variety of form, all of which I have attributed to the epithelium of the air-passages, more or less modified by the catarrhal affection. The most common constituent consists of the so-called mucus corpuscles, represented in Figs. 18-20, closely resembling colourless-blood corpuscles. These are spheroidal, pale, granular bodies; with no visible nucleus, and measuring from .009 to .012 mm. Usually isolated, they frequently lie in pairs and chains up to half a dozen or more. They often present a roughened aspect due to feeble extensions of the protoplasm as in the amœboid movement of colourless blood-corpuscles. Another element consists of larger spheroidal or ovoidal corpuscles, Figs. 21, 22, composed of granular protoplasm mingled with variable proportions of oil globules, and often appearing to have a central nucleus more or less obscured by the surrounding material. These corpuscles measure from .018 to .024 mm. or more.

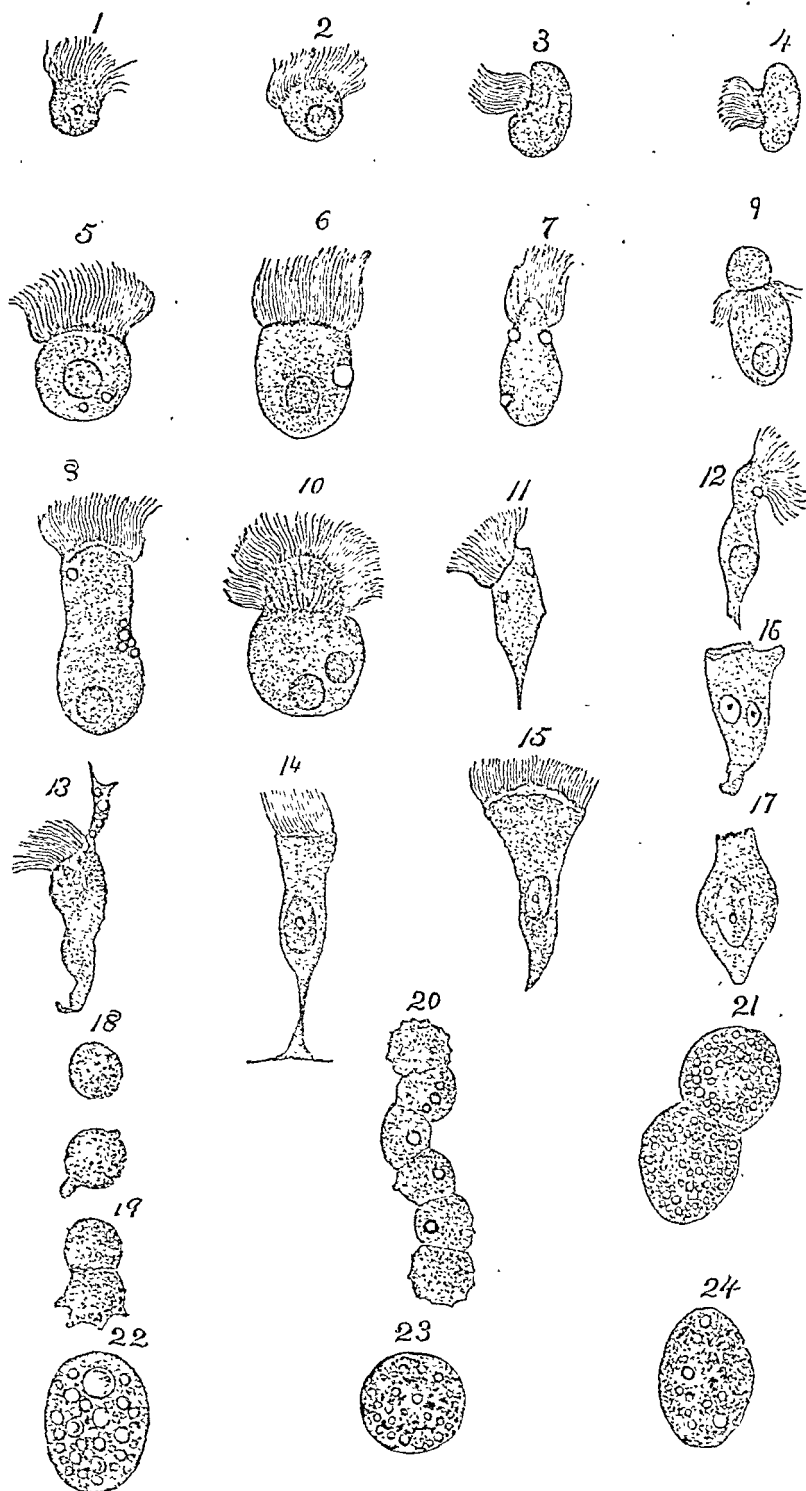
In my own habitual condition of health, for several years, I have been troubled with slight bronchial irritation accompanied with occasional coughing. The expectoration in small quantity consists of clear glairy mucus with little patches of dirty-yellow muco-purulent matter. I at first attributed the dirty hue to inhaled dust, but microscopic examination showed it to depend on corpuscles like those just described, containing more or less black pigment, as exhibited in Figs. 23, 24.

Other constituents of catarrhal mucus observed in ordinary cases, that is to say in common colds, etc., are as follows: Nucleated corpuscles, as large and rather larger than the associated mucus corpuscles. They are round, oval, or irregularly polygonal, and pale granular. The nucleus is large, oval and provided with a nucleolus.

Epithelial cells of every variety, from the small pale granular nucleated form resembling the nucleated corpuscles just indicated, to the large squamous form such as line the cavity of the mouth.

Isolated granules, variable in quantity and size, some of them pale and obscurely defined, others globular and resembling molecules of oil.

Occasionally a few coloured blood-corpuscles, without the obvious presence of blood. In the crystal clear liquid which drops from the nose in the commencement of a coryza, I have at times observed two solid elements, consisting of blood-corpuscles. These were very few in number, the greater proportion being colourless corpuscles exhibiting their characteristic amœboid movements. The coloured corpuscles were so few that there were usually only from one to three at a time in the field of the microscope.



EXPLANATION OF THE FIGURES.—Cell elements of catarrhal expectoration. All the figures magnified about 650 diameters.

Figs. 1-17. Mostly deformed epithelial cells.

Fig. 1. Globular cell, .003 mm., with minute vacuoles.

Fig. 2. Globular cell, .01 mm., containing a globular nucleus.

Figs. 3, 4. Reniform cells, .015 mm. long, without visible nucleus.

Figs. 5-7. Larger round, oval, and ovoid cells, .015 to .021 mm. long, with vacuoles; two with globular nuclei, and one without nucleus.

Fig. 8. Biscuit-shaped cell, .033 mm. long, with nucleus and small vacuoles.

Fig. 9. Gregarina-like cell, .024 mm., with nucleus. The circle of cilia waved up and down, while the head-like portion was bent from side to side.

Fig. 10. Gregarina-like cell, .027 mm. long by .021 mm. wide, with two nuclei. The head appeared covered with waving cilia, and the body rocked from side to side with a slight twist.

Figs. 11, 12. Columnar cells, .027 mm. long, with minute vacuoles, and one with nucleus.

Fig. 13. Columnar cell, .03 mm., with long protoplasmic vacuolated process projecting from amidst the crown of cilia.

Figs. 14, 15. Columnar cells, of nearly normal aspect, .036 to .039 mm.

Figs. 16, 17. Columnar cells, apparently deprived of their cilia, .027 mm.; one with two nuclei, the other with a single large nucleus.

In Figs. 2, 5, 6, 8, 9, 10, 12, the nucleus resembles a mucus corpuscle; in Figs. 14-17 it has the normal appearance. The specimens of 14-17 were dead or motionless; all the others exhibited waving of the cilia with active rocking motion of the body.

Figs. 18, 19. Ordinary mucus corpuscles, .009 mm., one with pseudopodal extensions.

Fig. 19. A pair of mucus corpuscles in contact.

Fig. 20. A chain of similar corpuscles, of which several contain vacuoles.

Fig. 21. Two large mucus corpuscles, containing oil globules, etc. Diameter .018 mm.

Fig. 22. A mucus corpuscle, with large oil globules. Diameter .024 by .015 mm.

Fig. 23. Globular mucus corpuscle, containing pigmentary matter, .018 mm. diameter.

Fig. 24. An oval corpuscle of the same kind, .024 by .015 mm. diameter.

## ARTICLE VIII.

### NOTE ON THE ELIMINATION OF ANTIMONY FROM THE HUMAN SYSTEM.

By HENRY MORTON, Ph.D., President of the Stevens Institute of Technology, Hoboken, N. J.

IN hopes of throwing some light on certain points connected with the elimination of antimony from the human system, concerning which there seems to be a degree of discrepancy, or at least uncertainty, in the works of the standard authorities on Toxicology, the following experiments were made by the present writer. Though they are far from exhausting the line of investigation indicated, it is believed that they at least establish some valuable data, and build up some few paces of the desired road.

In order to secure material for analysis, tartar emetic, in doses of half a grain each, was administered every evening, about ten o'clock, for three successive days, and the urine discharged was collected in two portions for each twenty-four hours, one being that discharged at rising in the morning, and the other consisting of the rest discharged at various times during the day and evening.

The analyses were conducted as follows: The fluid was concentrated to about one-third its volume by evaporation on the water-bath, hydrochloric acid was added, and sulphuretted hydrogen was passed through with occasional warming for about twelve hours. The precipitate was then separated by filtration and washed thoroughly, until no trace of chlorine could be detected in the filtrate with nitrate of silver. The filter

(paper and all) was then oxidized by repeated treatment with strong nitric acid and evaporated to dryness, and further carbonized by the action of strong sulphuric acid, aided by a moderate heat, not over  $100^{\circ}$  C.

When a portion of the charred mass yielded a colorless solution in boiling water, the whole was pulverized and digested with hot water, containing a little hydrochloric acid.

The clear colourless liquid was then separated from the carbon by filtration, and treated with sulphuretted hydrogen and warmed.

Antimony when present was then precipitated in minute flocks with its characteristic orange color, as hydrated tersulphide.

An assertion having been very confidently made that such a treatment as the above would fail to detect small amounts of antimony, because the organic matter present would prevent its precipitation by sulphuretted hydrogen, it was thought worth while to settle that question once for all by a decisive experiment, although the unsupported character of the assertion hardly entitled it to so much attention.

Accordingly, in several cases, after the first treatment with sulphuretted hydrogen, the liquids passing through the filter and washings were concentrated, oxidized with nitric acid, then with hydrochloric acid and chlorate of potash, and heated on the water bath until the smell of chlorine had nearly disappeared. Water was added from time to time to replace that lost by evaporation. Sulphuretted hydrogen was then passed through the liquids, and their precipitates were treated as before.

In no case was the slightest trace of antimony discovered in any of the filtrates thus treated; from which it evidently appeared that none had escaped the first precipitation with sulphuretted hydrogen, and that no advantage would have been gained by the application of the much more elaborate treatment involved in partially oxidizing the organic matter in the first instance.

The general results are here given in tabular form as the most convenient and explicit.

*June 18.* 10 P. M., first dose of  $\frac{1}{2}$  grain administered.

*19th.* 6 A. M., collected urine,  $7\frac{1}{2}$  ounces. Slight orange precipitate.

*19th.* To 10 P. M., collected urine, 17 ounces. Orange precipitate less than the previous one.

*19th.* 10 P. M., second dose of  $\frac{1}{2}$  grain administered.

*20th.* 6 A. M., collected urine,  $9\frac{1}{4}$  ounces. Orange precipitate in larger amount than the first.

*20th.* To 10 P. M., collected urine, 15 ounces. Orange precipitate larger than any before.

*20th.* 10 P. M., third dose of  $\frac{1}{2}$  grain administered.

*21st.* 6 A. M., collected urine,  $7\frac{1}{4}$  ounces. Orange precipitate like the previous one.

*21st.* To 10 P. M., collected urine,  $17\frac{1}{4}$  ounces. Orange precipitate like the last.

*22d.* 6 A. M., collected urine, 12 ounces. Orange precipitate less than those of previous day.

*22d.* To 10 P. M., 18 ounces. Orange precipitate larger than morning of same day.

23d. 6 A. M., collected 9 ounces. Orange precipitate less than on previous day.

23d. To 10 P. M., collected 19 ounces. Orange precipitate larger than in morning.

24th. Entire quantity collected 24 ounces. Orange precipitate about equal to second lot of June 23d.

25th. Entire quantity collected 30 ounces. Yellow colour appearing slowly; small precipitate only after standing ten minutes.

The above observations and results would indicate that antimony, when swallowed even in very small doses, is very promptly eliminated in part by the kidneys, and continues to be so eliminated constantly. With such small doses as were here employed, it is not likely that the elimination could have been traced much further than it was in these experiments, namely, for five days after the last dose.

The rate of elimination during these five days was steadily decreasing, the difference between the morning and later collection being simply such as should result from the larger quantity obtained in the second lot.

Whatever was the state of combination of the antimony on its elimination, it certainly was one which offered no obstruction to its precipitation by sulphuretted hydrogen applied in the usual manner.

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#### ARTICLE IX.

EXTIRPATION OF TERATOMA; OR, TERATOID TUMOUR. By DE SAUSSURE FORD, M.D., Professor of Special and Surgical Anatomy in the Medical College of Georgia (Augusta), Med. Depart. of the University of Georgia.

MARTHA C., mulatto, aged 44, of South Carolina, presented herself Feb. 1st, 1878, with a tumour upon the side of her face and neck, extending behind the ear, pushing the pinna forwards. She first noticed tumour, when about 18 years old, as "a small lump behind her ear," which gradually enlarged; but not until 1876 did it commence to increase rapidly. She is married, still menstruates regularly, but has slight prolapsus uteri, with leucorrhœa; has borne one child, a daughter, who has children, all of whom are healthy.

I believed the tumour to be fibro-cystic, and determined to operate; but, before doing so, passed a trocar and canula into its lower anterior part, and there issued through canula bloody serum.

*Operation.*—Assisted by a number of my associates in the Medical College, and the class attending the lectures, on Feb. 9th, 1878, sulphuric ether having been administered, an explorative incision, two inches long, was made from upper anterior border of tumour, extending downwards through integument and anterior layer of superficial fascia, to a distinct but thin fibro-cellular envelope which inclosed the mass. To ascertain its character, an incision was made through the sac, and a part of the mass taken out, which had some of the characters of encephaloid. The incision was further extended, when hemorrhage, from the interior, welled up, and, as quickly as possible, was literally grabbed out in fragments.

The hemorrhage continuing, the large cavern was freely irrigated, with a strong solution of perchloride of iron, which soon arrested it. An attempt was made to dissect out the sac, but bleeding became so urgent, it being necessary to ligate some small vessels in the bottom of the cavern, it was determined to cut away some of the redundant integument and sac from the external border of original incisions. The flaps were united by iron-wire interrupted sutures, leaving an opening below in which was placed a drainage tent. The parts secured by the sutures healed by primary union.



*Treatment.*—The sac was irrigated daily with *tar-water* by means of a syringe introduced through lower opening; when the tent was applied, and a compress saturated with *tar-water* was adjusted firmly with a roller bandage, sulph. quinia, 5 grs. at 6, 8, and 10 A. M., daily, was administered, until the suppuration had almost entirely ceased; this medicine having proved itself, in my judgement, to be one of the most powerful antisyphilitic remedies that we possess. One day the tent was omitted, the next the lower opening had united. Patient continued to do well until the 11th of March, when she had fever, and her face was very much swollen and fluctuating. The granulations in lower part were broken up with a grooved director, when a large quantity of offensive pus discharged. The pouch was again irrigated as before, and no tent used; after two or three days it again healed; on the 19th it became necessary to make a free incision into dependent part, when a half pint of offensive pus discharged, which was almost instantly *disinfected* by *tar-water* poured into the vessel which had received it. The incision healed in three days after same treatment, and the whole sac seemed to be destroyed; but on the 23d, my assistant, Dr. Thomas R. Wright, opened a small abscess behind the ear. At this time there is no appearance of return of the tumour, but there is a hard, indurated lump, of small dimensions, probably cicatricial remains of some parts of the sac.

The case being unusual, I sent a part of the tumour, with a photograph of woman before the extirpation, to my friend, Dr. Edward Wigglesworth,

of Boston, who interested himself in obtaining an analysis from Prof. R. H. Fitz, the distinguished histological authority at Harvard University, and to them am I indebted for the classification.

*Microscopical Examination by Prof. Fitz.*—"The portion of the tumour examined was remarkable for the number of tissues present, and the absence of any normal topographical relation between the different tissues. Islets and nodules of cartilage of irregular shapes were found imbedded within fibrous tissues; occasional clumps of fat tissue, and rare patches of mucous tissue were also present. Bands of epithelium resembling the rete mucosum formed gland-like groups, in the midst of which rounded bodies composed of epidermoid scales were situated. To such tumours Virchow has applied the term *teratoma*."

It appears that these tumours are usually found in the ovary, testes, or sacro-perineal region. In the former position they are usually described as solid ovarian tumours, in the latter two, as "foetus by inclusion"; therefore this case seems rare and interesting.

AUGUSTA, GA., Sept. 10th, 1878.

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#### ARTICLE X.

ON THE TREATMENT OF DYSENTERY WITH SALINE PURGATIVES. By  
JOHN A. LIDELL, M.D., of New York.

OF all the epidemic diseases, dysentery is the most severe and the most deadly. Outbreaks of typhoid fever, scarlet fever, smallpox, diphtheria, cerebro-spinal meningitis, and even Asiatic cholera, carry off fewer victims. Desgenettes states that dysentery killed more French soldiers between 1792 and 1815 than firearms in the great battles of the same period (*Trousseau*). In the Crimean war the British army lost 5950 men by death from diarrhœa and dysentery, it being "the amazing proportion of nearly 33 per cent. of the total deaths which are recorded during the war," while the same army lost by death from cholera only 4513, and by death from fever 3446 (*Med. and Surg. Hist. of the British Army in Turkey and the Crimea*, etc., vol. ii. pp. 84, 123, 166). In our own war of the Rebellion dysenteric diseases also headed the death list in the Union army. The medical historian of the war, Dr. Woodward, says: "37,794 deaths of white, and 6764 of coloured troops were due to the several forms of diarrhœa and dysentery, which must, therefore, be regarded as the most important causes of the mortality from diseases in our armies." (*Med. and Surg. Hist. of the War of the Rebellion*, Part First, Medical Volume, p. xliii. Introduction). And it is not difficult to understand this relative preponderance of the mortality from dysentery, for this complaint is not only very deadly, *per se*, but it also breaks out as an epidemic much oftener than



other diseases; and, again, it invades and re-invades particular regions at short intervals. But, acute dysentery often appears sporadically, especially in private practice, where it proves to be hard to treat, and frequently kills its victim. Moreover, acute dysentery, whether epidemic or sporadic, when left to itself generally shows a tendency to get worse, and is not disposed to end spontaneously in recovery. No one will be inclined to deny, then, that the treatment of this disorder is a subject of very great importance, and well deserves all the pains that can be bestowed on its elucidation.

The writer, however, does not intend to give anything like a complete exposition of the therapeutics of dysentery in this article. He proposes to confine his attention mainly to the showing from his own experience, and that of others, the singular value of saline purgatives, when judiciously employed, in the treatment of dysentery. The subject was first brought to his notice in 1851, at Bojio Soldado, a station on the Panama railroad, in New Granada, by his friend Dr. A. C. Baker, of Barry, Pike County, Ill. Tropical dysentery was then epidemic among the labourers employed at that station in building the road, and although most of the cases did well under the ordinary treatment of calomel and opium in small doses, etc. etc., there was still a large minority that did very badly under this plan of treatment. These patients fell into a state of more or less complete collapse, closely resembling the algide stage of malarial-congestive fever, and several died. In these cases the surface of the body became quite cool, much shrunken, and bedewed with clammy sweat, the face pinched and earth-coloured, the eyes sunken, the nose sharp, the hands shrivelled, the voice hollow, husky, and weak, the breath cold, the extremities, tip of nose, and tongue also cold, the pulse frequent, feeble, thready, intermittent, and finally wanting. Dr. Baker suggested the administration of cream of tartar in half ounce doses every four hours to such cases of dysentery, and gave as his reason for so doing a chapter from his own experience. He stated that in an epidemic of dysentery which once raged in Pike County, mercurials, opiates, blood-letting, both general and topical, etc., proved worse than useless, and he lost every case until he bethought himself to give the bitartrate of potassa in the manner above-mentioned, and then his success became almost as great as his failure before had been miserable. He remembered to have read somewhere, but exactly where he could not tell, that cream of tartar in purging doses had been used successfully in an epidemic of dysentery, when mercurials, opiates, antiphlogistics, and all other remedies had proved ineffectual. This happy recollection he put in practice with the excellent result just stated. The writer adopted his suggestion, with most excellent results also, in all the cases where the administration of the cream of tartar was begun in season. This plan of treatment proved most effectual in cases of bilious dysentery, and in cases where the inflammation of the colon was

complicated with malarial fever. In such cases the cream of tartar was given in doses of three and four drachms every three or four hours until large watery motions tinged with bile were produced, and the relief as to all the distressing and dangerous symptoms produced thereby was usually something wonderful. We ascribed the good results of this treatment, at the time, to the fact that the large, watery evacuations from the bowels greatly diminished the volume of blood in the portal vein and its tributaries, and in the organs drained by them, *e. g.*, the stomach, liver, spleen, pancreas, and intestines, thereby lessening the congestion or stasis of blood in these organs and parts in a corresponding degree, on the one hand, and to another fact that these large serous motions washed off the acrid slime, and the scybalous and putrid feces from the inflamed surface of the bowel, placing it thereby in a condition comparatively free from irritation, and in a state the most favourable for recovery.

The following case, which occurred in private practice, will serve pretty well to illustrate the immense benefit which may be derived from the judicious administration of saline purgatives to patients suffering from dangerous forms of dysentery :—

*Sept. 2.* I was called from bed at 4 A. M. to visit a young girl, aged 20, said to be in a very bad way, in consequence of an attack of acute dysentery; found that she had been sick seven days; that she had always been healthy before this attack; that she was suffering terribly from tormina and tenesmus; that her bowels moved so often she could not keep an account of the number; that her face was pinched; her eyes hollow and sunken; her pulse 110–120, weak and thready; that she had great debility and intense thirst; that the motions were very small, and consisted of clear blood, bloody mucus, bloody water like the washings of meat, and greenish frothy slime, but contained no feculent matter; that her bowels were swollen and tender under pressure over the sigmoid flexure, descending and transverse colons, especially the first-named portion of the intestine. I also found, on inquiry, that she had been faithfully treated with mercurials and opiates administered per orem, and with astringents and opiates introduced per anum, notwithstanding which she had gone on from bad to worse, until at the end of one week of agonizing suffering, her case was considered desperate and almost hopeless. Ordered the following: *R.* Potass. tart. (soluble tartar) and Potass. bitart. āā ʒj. Misce et divid. in pulv. No. 4. *Signa.* Give one powder every four hours until the bowels move freely. I also went with the messenger to the drug store, and routed out from his bed the prescription clerk myself, in order that the remedy might be obtained with the least possible delay, and the treatment might be begun at the earliest possible moment.

11½ A. M., visited the patient again. Her bowels were moved freely three times; one motion, however, was very large, scybalous, and very offensive in smell. All the urgent symptoms greatly improved. Says she feels like another person. Prescribed as follows: *R.* Pulv. ipecacuan. et Pulv. opii āā grs. vj; Quiniae sulph. grs. xxiv; Extract. glycyrrhiz. q. s. Ft. pil. No. 12. *Signa.* Give one pill every three hours. Give also imported Seltzer water for drink, and oatmeal gruel for food.

8 $\frac{1}{2}$  P. M. Says she continues to feel much better. Pulse 100 and fuller. Directed one of the cathartic powders ordered above to be administered at daybreak to-morrow morning, in the same way as the first one.

3d. 11 $\frac{1}{2}$  A. M., she is still better. Pulse 96. The purgative brought away another large scybalous motion, with bilious and feculent matter. Had rested well through the night.

8 P. M. At this visit found that she had had six dysenteric motions since morning; tormina and tenesmus, blood and mucus, much less. Ordered the pills of ipecac., opium, and quinia to be continued, and the following to be given at a dose, at 8 o'clock, to-morrow morning; R. Ol. ricini f $\overline{3}$ iv; Syrup. rhei aromatic. f $\overline{3}$ vj; Extract. rhei fluid. m $\overline{xx}$ ; Tinct. opii gtts. xx. M.

4th. Visited her at noon. She looks and feels a great deal better; bowels have not acted since the oil and rhubarb were given at 8 o'clock; pulse 90; abdominal swelling and tenderness gone. Prescribed the following mixture: R. Ammon. muriat.  $\overline{3}$ ij; Morphiae muriat. gr. j; Syrup. acaciae f $\overline{3}$ ij. M. *Signa.* Give one teaspoonful every three hours, mixed in water. The object sought to be accomplished by this remedy was the relief of the intestinal catarrh, which still remained. Beef tea for diet.

5th. 12 $\frac{1}{4}$  P. M. Found her condition very favourable at this visit; pulse 90; thirst gone. Ordered the mixture prescribed yesterday to be continued, and a cathartic powder, consisting of potass. tart. and potass. bitart., each two drachms, the same in composition as those given when I was first called, to be taken early to-morrow morning, and repeated, if necessary, to secure free catharsis, as I feared that putrescent feces and other morbid matters were again accumulating in the diseased part of the intestinal canal.

6th. 12 $\frac{1}{4}$  P. M. Found her sitting up. Says she feels well, although weak; pulse 85; bowels moved freely by the cathartic powder, and says she feels better for it. Ordered the sal ammoniac mixture to be continued, and the following pills: R. Quiniae muriat. grs. xii; Extract. nucis vomicae alcoholic. grs. iv; Althææ cum syrupo, q. s. ut ft. pil. No. 12. *Signa.* Take one pill three times a day.

8th. 2 P. M. She is doing exceedingly well. The symptoms of dysentery have all disappeared. Cautioned her as to taking food. Allowed her to go out of doors. Directed her, however, to continue the sal ammoniac mixture, and the pills of quinia and nux vomica ordered on the 6th.

11th. Pulse 70, and normal. Discharged her, *i. e.*, ceased my visits to the patient, because they were no longer needed. Advised her, however, to continue the pills of quinia and nux vomica for a month, and to take the sal ammoniac mixture again, if simple looseness of the bowels should return. But this visit ended the case, although her bowels remained weak and her stomach dyspeptic a long time.

*Comments.*—Under no other plan of treatment with which I am acquainted could this patient have done anything like so well as she did under the use of the tartar-salts in purging doses; indeed, there is good reason to believe that she would not have got well at all under any other method of treatment. However this may be, the marked relief which the saline purgatives afforded her is beyond dispute. Nor is it difficult to perceive the reason why these purgatives did so much good, when we consider the nature and quantity of the alvine evacuations which they produced,

especially on the first occasion of their use, viz., a chamber-pot almost full of horribly-smelling putrescent excrement, intermingled with hard lumps of feces or scybala. Recovery was obviously impossible until the inflamed gut was freed from this morbid matter. We can safely say that the saline cathartics were of great benefit, because they carried away the acrid slime together with the scybalous and putrefying feces from the inflamed part of her intestines, thereby placing this part in a state comparatively free from irritation and in a condition the most favourable for recovery. Impacted and decomposing feces, if allowed to remain even in bowels that are healthy, alone are enough to excite a dysenteric inflammation therein. No wonder, then, that she continued to grow worse so long as opium and astringents were administered with a view to arrest the movements of her bowels. Improvement in her case was impossible until the impacted and decomposing feces with other putrefying matters were carried away therefrom.

The case just related is the counterpart in every essential particular, excepting the patient's sex, of a sporadic case of bilious dysentery which I was brought to see, in consultation some years ago, viz. :—

*December 19, 1870.* The subject was a young man of good constitution, who, under a treatment consisting for the most part of opium and astringents administered for the purpose of stopping the action of his bowels, had gone on from bad to worse for a number of days, until, when I saw him, the tormina and tenesmus were terrible, and the symptoms of approaching collapse, already described, were distinctly marked and very imminent. Here, also, I insisted on the instant administration of purgatives. Consequently they were given, although with considerable reluctance, oleum ricini at first, and potassium tartrate afterwards. The operation of these purgatives was attended with an amount of relief from suffering and danger that was really wonderful to behold. This patient also made a speedy and excellent recovery.

In treating the acute and chronic forms of dysentery, I have very often had occasion to administer the saline cathartics, since their value was first brought to my notice in 1851, in the manner stated above. While serving as a medical officer in the army during the war of the Rebellion, I prescribed them in a great many cases of dysentery, and with most gratifying results. The particular salt mostly used was the sulphate of magnesia. Since the war I have prescribed the neutral salts in dysentery much more freely and much more fearlessly than I did before the war, because, perhaps, of the confidence as to their safety and value in that disease, which my army experience engendered. And I can truly say that I have never had occasion to blame myself for giving saline cathartics to patients having dysentery, whether in public or in private practice, in even a single instance; but I have, alas! had occasion to blame myself for not employing them freely enough in more than one instance.

Here, it may not be amiss to state that, during the latter part of 1862,

and throughout a period of seven or eight years subsequent thereto, the writer was compelled to make a frequent, sometimes almost a daily use of saline cathartics in his own person, because of chronic dysentery contracted in the swamps of the York and Chichahominy rivers, during the Army of the Potomac's campaign in this part of Virginia, that year. No other remedy, excepting quinia, ever did him a particle of good, so far as this disease was concerned. Opium, astringents, and stimulants always threw him into a fever, while subnitrate of bismuth, etc. etc., had no effect whatever. In those days he always felt decidedly lighter and better after the operation of a saline cathartic. The sense of immense distension and oppression or weight in the abdomen always passed away with the alvine evacuations produced thereby, the dysenteric motions themselves usually ceased for the time being, and, in this way, he was always made to feel much stronger and better. I have always thought that these saline purges did me good, mainly, because they removed portal congestion by virtue of the copious watery evacuations they occasioned, *i. e.*, they directly diminished the volume of blood contained in the portal vein and its tributaries, in the coats of the intestine and stomach, in the liver, spleen, and pancreas, etc. I have no doubt that they also did me good by washing out from my diseased bowels the acrid slime and the decomposing excrementitious matter. Finally, under their persistent use, I have made a pretty fair, although incomplete, recovery. I have tried a considerable variety of the saline cathartics, *e. g.*, cream of tartar, soluble tartar, Rochelle salts, citrate of magnesia, mineral water having cathartic properties such as Kissingen and that which is bottled at several springs of Saratoga, as well as Seidlitz powders, but principally the latter, for it has seemed to do best of all. The effervescing state in which this remedy can always be taken, has proved both agreeable and useful.

I will next supplement my own experience on this subject, which has been by no means small, by adding to it that of some others whose authority is generally acknowledged by the profession. Dr. Stokes (*Lectures on the Theory and Pract. of Physic*, p. 93, Am. ed.) says:—

“There was a very curious circumstance connected with the history of the epidemic dysentery of 1818–19. At one time the deaths happened to be very numerous, and everything which the experience or ingenuity of Dr. Cheyne could suggest failed in arresting the disease, in many cases. An English physician, who happened to be in Dublin at that period, and was in the habit of visiting the hospital, proposed the administration of large doses of cream of tartar, stating that he had tried it on several occasions under similar circumstances, and was convinced of its value. As the cases were not succeeding which had been treated after any of the ordinary modes, Dr. Cheyne consented to the exhibition of the cream of tartar, and allowed the physician to prescribe and administer it himself. Accordingly, he proceeded to give it in doses of half an ounce every fourth hour. Its first effect, generally, was to produce violent distress, and to aggravate all the symptoms, but, after three or four doses, bilious and feculent stools came away, and the patient experienced the most extraordinary relief. Many cases which had been considered desperate improved and recovered, and Dr. Cheyne expresses his conviction that many persons were saved by this prac-

tice, who would have been lost under the ordinary modes of treatment. One of the old German authors has alluded to this singular efficacy of cream of tartar in the treatment of dysentery; and from the result of Dr. Cheyne's experiments, there can be no doubt that it is entitled to a high rank among the remedies usually employed."

Concerning the treatment of dysentery Trousseau says:—

"In 1823, Bretonneau, a man profoundly clinical, dismayed at the non-success of a system of treatment, based upon a preconceived theory rather than upon sound observation, resolved to place himself in opposition to the deplorable practice which resulted from the doctrine of the Val-de-Grace.

"Having before him, as exemplified in his own practice and that of many others, the sad results of indiscriminate resort to the antiphlogistic treatment on all occasions, and without reference to the form of the disease, he set himself to make trial of the treatment by purgatives, in accordance with the plan followed by Stoll, Zimmerman, and Fringle, all of whom stated that they had found it very useful.

"The trial was attended by success. He then sought for an explanation of the successful results obtained; and he came to the conclusion that in dysentery, as in dothinerterea, the *quality*, the specificity of the local inflammation, plays a much more important part than its *quantity*: he likewise thought, that most probably the beneficial action of purgatives was due to their substituting for a specific local inflammation of bad type, another inflammation which, although it has also a specific character, has a natural tendency to cease.

"While in respect of Broussais's doctrine theory took the lead, and moulded facts to its service, Bretonneau's doctrine advanced, under the simultaneous and combined support of observation and theory. From that time, and in the different circumstances in which he was placed, the illustrious physician of the hospital of Tours recognized that the purgative treatment was that most frequently indicated in dysentery.

"In the account given by Dr. H. Parmentier and myself of an epidemic which prevailed in 1826 in the department of Indre-et-Loire, you will find it stated that a really great proportion of recoveries followed the treatment just described. I have long employed it; and it has rendered me signal service in the different epidemics against which I have had to contend.

"Such was the case in the epidemic of 1848 in the garrison of Versailles, whither I went every morning to study the disease in the wards of the military hospital, then in charge of my honorable colleagues, Drs. Perrier, Follet, and Godard.

"In the reports communicated to the Academy of Medicine, to which I have just alluded, there is expressed an almost unanimous opinion in favour of this powerful method of treatment. Nearly all the reporters state that the administration of purgatives was the chief means by which they opposed the disease; and that the purgatives which they principally used were the neutral salts, such as sulphate of soda, sulphate of magnesia, and the neutral tartrate of potash and soda, called *sel de Seignette*.

"These are the medicines which you have seen me prescribe in the cases which have come under your observation. In my civil practice, I always have recourse to them, particularly in the commune in which my estate is situated, where this year dysentery has committed great ravages. My own household was not spared, several members having been attacked, and one child died. My farm-bailiff was seized with the malady; I gave him the neutral salts; and though he committed imprudences, he recovered. Generally, persons recover who are treated in this way.

"The evacuant method praised by the physicians of the last century, and particularly the administration of the neutral salts in purgative doses once daily, or morning and evening, so as to induce diarrhœa, is, therefore, the best treatment of dysentery.

"Does it follow that we are to confine ourselves to the use of the sulphates of soda and magnesia, and the salts of Seignette? Certainly not; there are cases

in which other purgatives may be employed with advantage."—(*Lectures on Clinical Medicine*, vol. iv., pp. 176–178, New Syd. Soc. translation, London, 1871.)

Among purgatives other than the neutral salts that have done good service in the treatment of dysentery the mild chloride of mercury, administered in large doses, *i. e.*, in doses of twenty grains and upwards, stands the highest and deserves some mention in this place. In several instances where the symptoms of dysentery became complicated at an early period in the history of the case with the symptoms of sudden collapse that belong to the cold stage of malarial-congestive fever, incessant vomiting of bilious matter being also present, and the patient's life in imminent peril, I have administered forty grains of calomel at one dose with most excellent effect on the dysenteric as well as on the congestive phenomena. In those cases calomel was selected as the purgative to be given before exhibiting large doses of quinia, because, from the character of the vomiting, no other purgative would be likely to stay in the stomach after being swallowed. By so doing, *i. e.*, by giving calomel and quinia in large doses, I have saved several cases of dysentery complicated with malarial-congestive fever that were apparently hopeless. I have, also, several times administered calomel in purgative doses to dysenteric patients having constant nausea with frequent vomiting when malarial-congestive fever was not present, and, likewise, with most excellent effect.

In this connection it may be of interest to state that, in 1812, at Gibraltar, numerous deaths from dysentery having occurred in the garrison, Dr. Amiel, Surgeon-Major of the 12th Infantry, gave calomel in doses of about twenty-five grains, morning and evening, until the stools ceased to be mucous and sanguinolent, then the dose was reduced, and, afterwards, this remedy was discontinued altogether, lavements being used in its place. So great was the success of this treatment that the Director-General of the Army Medical Service made obligatory its employment by all the other medical officers. This plan of treatment, however, should not be indiscriminately used, for further experience with it has shown that it is exceedingly liable to induce ptialism on the one hand and mercurial defibrination of the blood on the other. But, at the same time, there are cases of dysentery where the administration of calomel in purgative doses is absolutely demanded; such, for example, as cases of dysentery attended with vomiting, where nothing but some weighty substance like calomel can be retained on the stomach; and cases of dysentery complicated with malarial-congestive fever of a very dangerous type; and, lastly, cases of dysentery occurring in children who, for the most part, refuse to take the saline and many other purgatives on account of their disagreeable taste, but who will readily take calomel, especially if it be given in the form of powders combined with sugar. It is not improbable that when calomel is administered in minute doses in dysentery with benefit, the good it does is mainly due to its purgative properties.

As for myself, the longer I live, and the more cases of dysentery I treat, and the better I become acquainted with this disease, the more I am inclined to agree with Trousseau in declaring that "in point of fact, in accordance with Stoll's correct observation, dysentery ought to be considered as one of those disorders in which the bowels are confined," and, therefore, a disorder which, for the most part, should be treated with opening medicine.

With regard to the use of opium, and binding medicines in general, in the treatment of dysentery, I have related two cases above which show how they may be administered with very damaging effect. I have, therefore, to enter my protest against the lamentable manner in which these medicines are too often abused. When opium is indicated it is not for the purpose of stopping the dysenteric flux, but for moderating the accompanying pains, and especially for checking the vomiting which renders the administration of other remedies impossible. The doses of opium must be small, usually not more than one-fourth of a grain of the powder, or one-sixteenth of a grain of morphia, and repeated at short intervals, for by giving large doses, the malady will become complicated by formidable typhoid symptoms.

The cases of dysentery which especially demand the exhibition of saline purgatives are: 1. Those in which the bowels are habitually constipated, for example females, and people of sedentary habits, for such cases are generally burdened with intestinal accumulations which can be gotten rid of only by repeated doses of purgative medicine; 2. Cases of bilious dysentery; 3. Cases where portal congestion is present; 4. Cases complicated with malarial fever, or with malarial intoxication and ague-cake; and, 5. Cases of chronic dysentery. In all cases the doses should be repeated until bilious and feculent matter appears in the stools.

Saline purgatives do good in dysentery, 1, by diminishing the quantity of blood in the portal vein and its tributaries, and in the abdominal organs generally; 2, by expelling the noxious contents of the intestinal canal; and, 3, according to Bretonneau, by substituting for a specific local inflammation of bad type, another inflammation which, although it is specific, is of benign type. The potassium tartrate and the potassium bitartrate should generally be preferred.

The treatment of certain forms of dysentery with saline purgatives, which I have recommended above as based on my own observations and on the experience of many physicians, is unfortunately not infallible, although many patients may be saved by it who would otherwise be lost. In conclusion, I repeat, that epidemic dysentery is the most formidable and dangerous of all the epidemic diseases.



## ARTICLE XI.

INEQUALITY IN LENGTH OF THE LOWER LIMBS, WITH A REPORT OF AN IMPORTANT SUIT FOR MALPRACTICE; AND ALSO A CLAIM FOR PRIORITY.  
By WILLIAM HUNT, M.D., Surgeon to the Pennsylvania Hospital, Phila.

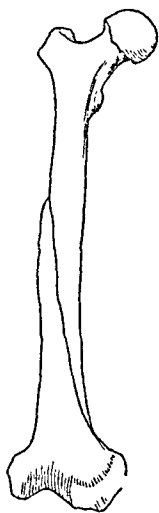
ON the 12th and 13th of April, 1878, an interesting suit for malpractice was tried before Judge Junkin, in New Bloomfield, Perry County, Pa. The case was that of Weaver *versus* Strickler. On the 10th of March, 1877, Weaver's child, a boy in the eighth year of his age, broke his thigh. Dr. Strickler was called, and pronounced the limb fractured near the knee. There did not appear to the eye to be any material shortening or deformity. The doctor moulded splints of stiff binder's board to the limb after reducing the fracture, and kept the boy in bed. The patient did well, and at the end of four or five weeks the father told Dr. Strickler that he need not attend any more, as he himself could now manage the splints. The doctor did not see the boy again for some weeks, when he was called upon by the father, who told him that he had made a great mistake, that he had said that the limb was broken near the knee, when, in reality, it was broken in the upper part of the thigh, as there was a lump showing itself there. Dr. Strickler immediately visited the patient, and examined the limb. He found union perfect, but, much to his chagrin, there was a projection (the lump in question) at the junction of the upper and middle thirds. The shortening was, by his measurement, three-quarters of an inch. Weaver claimed that his boy was irretrievably injured, and shortly afterwards entered suit for damages against the doctor. During the year before the trial the boy obtained very good use of his limb.

Dr. D. Hayes Agnew and myself were summoned as experts by the defendant. When the trial came on, the judge directed that we should take the boy into a private room, and there examine him thoroughly. Neither of us had seen him before. He was stripped and laid upon a table. By accurate measurement we found five-eighths of an inch shortening, or rather this difference between the two limbs. There was a bony projection upon the upper part of the injured thigh, but the line of the limb was normal. There was a slight increase in thickness of bone above the knee on the same side. The joint movements were perfect. The boy was able to walk and run with a very slight, if any, limp.

The witnesses for the plaintiff were the father, the mother, and a number of medical gentlemen. After the parents' stories were heard as to the sufferings of the patient, his treatment by the doctor, and his present condition, the surgeons were called. All appeared to be men of intelligence and experience, and I think each one testified that, however differently he might have treated the case had it been his, the result was equal to the

average of recoveries after such injuries. The usual confusion was made by the lawyers as to extension and counter-extension, as to their absolute necessity in treatment, as to the sufficiency or insufficiency of the means used in the cure, and, above all, great stress was laid upon the fact that the limb was declared to be broken where in fact there was no fracture. The deformity and future prospects of the little patient were, of course, strongly presented.

Dr. Strickler himself was the first witness called for the defence. He acknowledged his diagnosis of a fracture near the knee; he said there was very little perceptible shortening at the time, and finding that his binder's-board splints retained the limb in good position, he continued the treatment until he was discharged from the care of the case. He also acknowledged his surprise at finding the "lump" in the upper part of the thigh, and was in doubt as to what it was. Whilst sitting in court, Dr. Agnew and myself were trying to reconcile the facts of the case, and to explain the diagnosis. We each drew a diagram, and agreed upon one which, without any forced construction, seemed to fit the case, and which was shown to the jury, and carefully explained by the defence (See figure). The thigh might have been really broken near the knee on the inner side, and yet the fracture might have been a very oblique one, and thus the projection of the upper end of the lower fragment may be accounted for.



The writer was the first expert witness examined for the defence. He testified as to the various methods of treating fractures of the thigh; that any particular method is a matter of choice by the surgeon; that frequently splints and pressure are sufficient, especially for children, and that he had, at that very time, cases under treatment with stiff binder's-board splints; that experience, knowledge, and watchfulness were more essential than any especial boards and bandages; and that, provided the parts were kept in apposition and in healthy condition, it made no particular difference how it was done; often it was done with no splints at all. The diagram was produced and explained to the judge and jury. The projection was accounted for; but how about the shortening? Was there lameness enough to indicate much real shortening? No. Here comes an episode in our narrative. Between the morning and afternoon sessions of the court, and before the defence was called, a group of us were standing at the door of Dr. Strickler's office, and with us a little boy of the doctor's, who was in the twelfth year of his age. Finding that he had never been the subject of injury, I proposed that we should take him into the doctor's office, and strip and measure him. Agreed. We laid him upon

a flat wooden settee, and after taking the utmost care as to position and lines, Drs. Agnew, Strickler, Orris (I think), and myself, measured him. We all agreed as to there being three-eighths of an inch difference between the two limbs, measuring from the anterior-superior spines to the internal malleoli. This fact was communicated to Mr. W. N. Seibert, who ably conducted the examinations for the defence.

To return to court: my examination was continued, and the above fact was ingeniously brought out somewhat in this way: "Q. Doctor, are you aware that a person who has never been injured may present differences of length in the measurements of his own limbs? Ans. I am. Q. Is that the rule as to most persons, or is it the exception? Ans. I believe it to be the rule. Q. What is the range of difference, so far as you know? Ans. Say from an inch and a quarter to nothing. Q. And nothing is the exception? Ans. Yes. Q. Have you measured anybody recently? Ans. Yes. Q. When? Ans. To-day. Q. Anybody in this village? Ans. Yes, sir. Q. Who? Ans. Dr. Strickler's little son. Q. What did you find with him? Ans. A difference of three-eighths of an inch. Q. And five-eighths of an inch is all Dr. Agnew and yourself found in Weaver's boy? Ans. Yes, sir."

I think I was subjected to no cross-examination. It was late at night, and the court adjourned. In the morning Dr. Agnew was called. Very much the same ground was gone over, of course, as in the writer's examination, for we both had precisely the same opportunities of examining the case, but the weight of the Professor's opinions and experiences was evidently a power in the court. I think, also, here there was very little, if any, cross-examination.

After Dr. Agnew left the stand the plaintiff's counsel held a short consultation, and, much to our surprise, abandoned the case, technically, I believe, took a nonsuit.

Thus ended the first trial for malpractice, in which the new facts as to measurements were brought with great effect before a legal tribunal.<sup>1</sup>

Not the least interesting fact to note here is, that the defendant's experts were surgeons of the Institution where the observations as to the inequality of the lower limbs in the same person were originally made.

During the past two years frequent notices of this discovery and of its importance have appeared in the medical, scientific, and popular journals, and also in the newspapers. The credit, however, is always given to Dr. Wight, of Brooklyn, N. Y., or to a surgeon of Brooklyn, New York.

Dr. Wight's first paper that I can find appeared in the *Archives of*

<sup>1</sup> Mr. Seibert writes under date of September 20, 1878. "The boy, J. B. Weaver, has perfect use of his leg, if his free running about upon the street with other boys of his age (between whom and him there is no visible difference in use and perfect locomotion) is to be the matter upon which judgment is based."

*Clinical Surgery*, vol. i., No. 8, February, 1877, New York. His second paper is in the *Proceedings of the Medical Society of the County of Kings*, stated meeting, January 21, 1878.

Therefore, besides reporting this case for its intrinsic interest and importance, I have another object in view in the same connection. I wish to make a claim of priority in *the discovery and full surgical appreciation of the fact that asymmetry as to length of the lower limbs of the same person is the rule and not the exception*. Some time about 1872 and 1873, the members of the surgical staff of the Pennsylvania Hospital, then consisting of Drs. Hewson, Hunt, Morton, and Levis, were greatly interested in the subject of measuring. The discrepancies were found to be puzzling, and it was difficult to reconcile them. Dr. Morton had in his wards a case of fractured thigh which resulted in perfect union, but the broken limb was half an inch longer than the sound one, although it appeared to make no difference to the man after he got about. This led Dr. Morton to devise a measuring instrument, consisting of a delicate central bar with cross slides and stops. Even with this instrument irregularities were noticed which were difficult to account for. Dr. W. C. Cox was then Dr. Morton's resident and assistant, and it had already occurred to him to measure both sides of persons who had never been the subjects of injury. He used the measuring tape. The results were so surprising as to encourage further investigation.

The writer of this article took great interest in the matter, and the first note he can find about it is one written by him, and published in the *Philadelphia Medical Times* of January 16, 1875, under the heading "Clinical Notes and Reflections." In it he says, "It is well known that bilateral symmetry may be said not to exist as to breadth, but has it ever occurred to any one to state as a law that bilateral symmetry as to length is exceptional?"

In the mean time Dr. Cox's measurements were continued, and in the April, 1875, number of the *American Journal of the Medical Sciences*, he published his first table, giving the results in fifty-four sound persons. The variations were from  $\frac{1}{8}$  to  $\frac{7}{8}$  of an inch, and only six persons in the list presented equal lengths of the lower limbs.

After this paper was published our interest in the matter did not cease. I frequently made the remark that the publication of it did not attract nearly the attention that it deserved from the profession. I had some correspondence about it. Among others, I wrote to Drs. Billings and Baxter, of the U. S. Army, for I noticed in the volume of medical statistics from the Provost Marshal General's Office, 1875, where there is a great deal on the subject of anthropometry, that nothing whatever is said on the point in question. These gentlemen were kind enough to be interested, and promised, if possible, to aid in further investigation.

The following letter was received after the writer had read my paper calling attention to Dr. Cox's forthcoming article.

London, February 5, 1875.

*Dear Sir:*—I thank you for sending me your paper of January 16. The part on measurement I have read with much interest, but I doubt whether a want of symmetry will appear if the estimate be made with the eye. I very rarely use measuring tapes or anything but the eye. The eye is surely more exact.

Very truly yours,

Dr. HUNT.

JAMES PAGET.

It appears evident that the distinguished surgeon had experienced the difficulties and puzzles of measurements, and had as a rule given them up.

It is not my intention to discuss here the causes of the inequalities under notice, or in what parts they are to be found. These have already been fully considered. Dr. J. B. Roberts has an interesting paper in the *Philadelphia Medical Times* of August 3, 1878, in which he gives the measurements of the lower extremities of eight skeletons. Asymmetry here is the rule. I differ, however, from the doctor in his remark, "It occurred to me that we could *best settle* the question by taking the bony skeleton itself." The practical question for the surgeon is, does the lower extremity of one side of the normal living man differ from the other in length as a rule? Many factors may enter into accounting for the difference. We have to deal with the living man, and we should recognize these differences whether congenital or acquired in corresponding parts of *the individual*, so that when accident or disease makes him a subject of treatment, we need not try to force a result that cannot be attained. The American Medical Association did well to commit itself to no such dogma as this.

That eminent authority on fractures, Dr. Frank H. Hamilton, was at first unwilling to admit these important new facts as to measurements. He is now, from his own researches and from those of Dr. Cox and Dr. Wight, fully convinced of their truth. He writes to me, "I think the subject of sufficient importance and so creditable to American study, as to entitle it to a more conspicuous notice and a faithful historical record," and wishes that I would undertake the task.

In this short record I give the dates. These are so wide apart as to leave no room for controversy. Dr. Wight's papers are most elaborate and important contributions to surgery. In a foot-note at the end of the paper in the *Archives* of February, 1877, the work of Dr. Cox is mentioned, with the references to it. Dr. Wight speaks of it as substantiating his own observations, but does not allude to it in the body of either of his articles. There is a statement, however, on page 348 of the *Proceedings of the Medical Society of the County of Kings* which requires correction. Dr. Wight says, "Now, as near as I can determine from the sources of information at hand, about 900 cases of fracture of the bones of the lower extremities were treated in the Pennsylvania Hospital during a period of

123 years; a very liberal estimate would make 400 of these cases fractures of the femur." The sources must have been meagre, for here is the record:—

During a period of 127 years, terminating 4th month 27, 1878, 11,161 fractures of all kinds were treated in the Pennsylvania Hospital!

This is exclusive of a very large number cared for by the out department. Owing to so many walking cases, any table or yearly report will show that about half of those treated *in the house* are injuries of the lower extremities. In 44 years alone, *i. e.*, from 1830 to 1874, 3816 cases of fractures of the lower extremities are recorded and analyzed, and of these 1181 were fractures of the thigh.

In the same time 3760 cases of fractures of the upper extremities were treated.

From the whole number then, and from this completed record, it is fair to presume that the number of fractures of the lower extremities treated in the Pennsylvania Hospital since its foundation must be quite, if not more than *six thousand*.

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## ARTICLE XII.

THE SEDATIVE ACTION OF QUINIA ON THE NECK OF THE BLADDER. By D. B. SIMMONS, M.D., Chief Surgeon to Ken Hospital, Yokohama, Japan.

THE relief obtained from some of the more distressing symptoms attendant upon certain affections of the bladder, by the injection of quinia into that viscus, is pretty generally known.

I do not remember having seen it anywhere stated, however, that the same results may be obtained by the administration of this drug, by the stomach. It was a mere accident that I discovered this fact, while attempting to relieve, in a young man of 26, by all the means known to science, the most painful and persistent vesical tenesmus I have ever met with. Though the case is obscure, I believe it to be one of "villous growth" of the bladder, situated near the neck. Having occasion to administer some quinia for symptoms of a malarial character, the patient took by mistake the fifteen grains at once, which was ordered in divided doses. In about one and a half hour his tenesmus was *almost completely relieved*, but it returned, however, after eight or ten hours, though less severely.

As the patient declared the quinia had given him this short respite from long suffering, I repeated the dose, with the same result. Being an intelligent fellow, I now gave orders that a number of packages of the drug be given him, of 10 grains each, to be used as the relief obtained by each dose passed off. In the course of two or three days he came to find that

10 grains, morning, noon, and night, sufficed; and though his desire to pass water every fifteen or twenty minutes continued about as usual, there was no pain. The contractions of the bladder were evidently the same, but the uncontrollable desire to do more than empty the viscus, as is evidently the mechanism of what we understand by tenesmus, was wanting. The urine, small as the quantity may have been, simply flowed out, and nothing more. Though I had some time before injected *quinia* into the bladder, in the usual quantity and manner, the mere passage of the catheter, however, caused so much pain and bleeding, that the patient refused to continue it, or give it a fair trial, the relief gained at that time not being very apparent. I have since persuaded him to try it again, more for the purpose of testing the value of the two means of administering the medicine than to better his condition. This time he found relief (the medicine by the stomach having been discontinued), but not equal to that obtained by the other method. I then asked him to use both at the same time, the quantities of the quinia to be about equally divided, *i. e.*, 15 grains by the stomach and 15 by the urethra. By this plan there has been a decided gain over either separately, so that the patient insists on carrying it out. As far as I have been able to ascertain the time, in this case, for the effect of the drug to be felt in a relief of the symptoms, is about the same, whether administered by the stomach or urethra, *viz.*, one and a half to two hours.

Since making the above observations, Dr. Eldridge, of this place, and Dr. Price, of the U. S. Navy, have, at my suggestion, tried the administration of quinia by the stomach in two very severe cases of vesical tenesmus. In one, a very severe and old cystitis, the relief was very decided; and, in the other, a cure was effected by two 10-grain doses—probable cause retrocessive gonorrhœa. In the latter class of cases I anticipate the quinia treatment will be of great service, though not having had an opportunity to put it to the test myself. Here, especially, it would have decided advantages over the injection of the medicine into the urethra, though I am not aware it has been used in this class of cases, in this manner.

The practice of administering a full dose of quinia, or even several doses, before operating on the urethra, is, I believe adopted by most surgeons with the idea that it renders less liable the so-called urethral chill, but *how*, I have never seen satisfactorily explained. I think, however, that in view of the above facts, this question is answered by the heading of this article, *viz.*, the sedative action of quinia on the neck of the bladder, whereby the nervous shock (whatever this may be) of the operation is prevented. It is a question of no little interest in this connection, whether the drug acts through the medium of the nervous centres or directly on the terminal nerves of the part, after elimination by the kidneys.

## ARTICLE XIII.

ACTION OF THE CILIARY MUSCLE IN ASTIGMATISM. By H. GRADLE, M.D.,  
of Chicago.

CAN regular astigmatism be partly or wholly corrected by an unequal contracture of the ciliary muscle? This question was answered in the affirmative some ten years ago by Dobrowsky, and his opinion has since been generally adopted. It is rare, however, that so positive a proof of it can be furnished as by the following case:—

A. S., 17 years of age, had complained of ocular fatigue and even slight pain for many years. One year ago he obtained a pair of concave cylinders 24, but the old trouble was but little alleviated. On examination I found a convergent strabismus of the left eye, with a slightly paretic condition of the external rectus. On covering the other eye the usual secondary deviation occurred, slightly more excursive, than the primary deviation of the left eye, while both eyes performed oscillatory movements. This nystagmus I could time very easily; it consisted of a comparatively slow movement of the left eye towards the right side (action of rectus internus), alternating with a rapid jerk to the left, in order to bring the visual axis again into the desired direction. The movements of the other (not squinting) eye were the same in direction and evidently secondary, *i. e.*, due to association. This nystagmus occurred only when the right eye was covered; its cause must be sought in the insufficiency of the paretic external rectus of the left eye. The directions of these ocular movements and of the *apparent* motion of external objects resulting from the nystagmus, corresponded with the ocular phenomena due to vertigo or lesions of the semicircular canals.<sup>1</sup> Omitting further discussion of these motor anomalies, as well as all irrelevant details, I can describe the optic condition of the left (strabismic) eye as a myopic astigmatism of about 10 dioptries; accurate determination being impossible on account of the diminished visual acuity ( $V$  not quite  $\frac{20}{200}$ ). The sight of the right was also less than normal, its corrected  $V$  being  $\frac{20}{80}$ , while the apparent refraction was M 2 D with As M 5 D. After a thorough use of atropia for two days, I re-examined and found the correcting glass for the left eye equal to cylinder —10 dioptries. But since the amblyopic eye did not take part in binocular vision, all further remarks apply only to the right eye, the correcting glass of which, when atropinized, was found to be cylinder —6 D, axis horizontal. There was, besides, considerable irregular astigmatism, which could only be remedied by a stenopaic slit.

A fortnight later Mr. S. returned, complaining that he could not use his glasses for reading, although reading was possible with his former spectacles (cyl. —24), and even with the naked eye. For the distance his glasses gave perfect satisfaction, his sight had even improved ( $V \frac{20}{80}$ ), since he had learned to ignore the circles of dispersion due to the irregular astigmatism. The effects of atropia had completely disappeared as far as the iris was concerned, and on removing his glasses I could satisfy myself that his power of accommodation was the same as before the use of atropia. It seemed to me most likely that his inability to read with his correcting glasses was owing to a *partial* contraction of the ciliary muscle,

<sup>1</sup> Vide H. Gradle, Chicago Med. Journal and Examiner, Aug. 1878.



tending by itself to correct his astigmatism, and hence rendering the glass, which was exact for the distance, too strong for the near point. I tested this view with some large print, which the patient read distinctly at a distance with his glass. On bringing the paper nearer to the eye, it began to get blurred at a distance of one metre, the indistinctness increasing with the proximity to the eye. In order to maintain distinctness, it was found necessary to diminish the strength of his correcting glass (cylinder  $-6$  D, axis horizontal) by neutralization with convex cylinders in the ratio of the proximity of the object. Thus at one metre distance the strength of his glass had to be reduced by one dioptric, while with an object 25 centimetres off a convex cylinder of 4 D was required to neutralize the excessive strength of his own glass. While the ciliary muscle was completely at rest on correcting the eye for the distance, there occurred—evidently from previous habit—a partial contraction (of those fibres only influencing the horizontal meridian of the lens) on attempting to see close by. In the absence of any glass, *the eye would have corrected in part its own astigmatism, the degree of correction increasing with the proximity of the object.* The inability to contract the ciliary muscle uniformly was shown by the following crucial test. An emmetropic eye can see plainly in the distance through any concave glass, which it can overcome by its own accommodation. But this patient, with his eye corrected for the distance, could *not* see distinctly through a concave glass of 4 dioptries. Instead of an accommodative effort equal to a spherical glass of 4 D, his ciliary muscle increased the refraction of the *horizontal* meridian only, and in order to see distinctly, it was necessary to use an additional *convex cylinder of 4 D, axis horizontal* (or in other words to diminish his correcting glass from a concave cylinder of 6 D, axis horizontal, to 2 D, the remnant of his astigmatism being neutralized by his own accommodation).

My assurance, that the patient would gradually learn to contract his ciliary muscle uniformly, and get his eye accustomed to the full artificial correction of its astigmatism, proved correct. One week later reading became easier, and, testing him with glasses, only weaker convex cylinders were required to neutralize the excessive strength of his own glass for the near point. Within about six weeks all trouble had disappeared, and the mode of ciliary contraction had become normal.

In the above description I have referred to ciliary contraction as the cause of accommodation for the near point, notwithstanding the objections urged by Dr. M. J. De Rosset. In the last number of this Journal Dr. De Rosset attempted to overthrow the usually accepted theory of accommodation, substituting for it the statement, that accommodation for the near point is the result of *relaxation* of the ciliary muscle, while the adjustment of the eye for distance depends on the contraction of the same. His main arguments, however, belong to the class of "circumstantial evidence," which must receive an interpretation, in order to be utilized; and the interpretation according to the Helmholtz theory appears natural. But apart from indirect arguments, the theory of Helmholtz is directly proven by the experiments of Hensen and Völkers. Every excitation of the ciliary ganglion or nerves caused in their experiments an accommodative movement. This they demonstrated by needles introduced as

levers through the sclerotic. The needle piercing the ciliary body, and the one passing through the fovea centralis did not move, the others did, demonstrating, *that a ciliary contraction pulls the choroid forward*. Other needles acted upon as levers by the surfaces of the lens showed, that with increasing convexity the anterior surface of the lens advances considerably, while the posterior surface recedes very slightly. A last lever finally proved the advancement of the zonula with every accommodative effort. The movements of the lens could even be observed directly on ablation of the cornea. These observations pertain not only to the eyes of the dog, cat, and monkey, but were also confirmed on an extirpated human eye. They establish positively the following as the order of cause and effect: nerve-excitation, contraction of the ciliary muscle, advancement of the insertion of the zonula, and hence its relaxation, increasing convexity of the lens.

The doubts which De Rosset expresses as to the more recent experiments of Hensen and Völkers do not seem justified. Whenever the experiment did succeed, they obtained an accommodative movement from excitation of the trunk of the motor oculi. The want of success in many experiments does not surprise any one familiar with the mutilations incident to, and the difficulty of experiments on, intracranial nerves. The belief that any other nerve is concerned in the function of accommodation has no experimental or clinical basis. In previous experiments Trautvetter had also failed to obtain an accommodative response from excitation of the third nerve in mammals, probably on account of similar difficulties. In birds, however, accommodation for the near point was obtained by stimulation of the motor oculi.

The positive evidence of these experiments once accepted, the further arguments of Dr. De Rosset lose their validity.<sup>1</sup>

<sup>1</sup> The last number of the *Centralblatt f. d. Med. Wiss.* (No. 43, 1878) contains a communication by Dr. J. Hock, of Vienna, which fully corroborates the experiments of Hensen and Völkers, on stimulation of the short root of the ciliary ganglion (the motor oculi nerve). In curarized dogs he could easily observe the increase of convexity of the anterior surface of the lens as manifested in the changed size of the reflected image of a calcium light. In order to keep the pupil dilated during excitation of the third nerve, he resorted ingeniously to simultaneous excitation of the sympathetic. Needles piercing the sclerotic showed further that a ciliary contraction pulls the choroid forward, but does not act directly on the vitreous body. All manifestations of contraction of the ciliary muscle were completely prevented by an energetic application of atropia.

## ARTICLE XIV.

THE POTASSIUM BROMIDE AND SUSPENSION OF THE ACTION OF THE STOMACH IN THE TREATMENT OF UNCONTROLLABLE VOMITING OF PREGNANCY. By SAMUEL C. BUSEY, M.D., Washington, D. C., Professor of the Theory and Practice of Medicine, Medical Department of the University of Georgetown.

IN the number of the *American Journal of the Medical Sciences* for January, 1878, p. 146, I published several cases of this intractable affection, treated successfully with this salt, administered in the form of enemata, in combination with nutrient and stimulating ingredients. Since the publication of those cases another has occurred in my practice, the history of which is as follows:—

On May 20th (1878) I was called to see the wife of a brother practitioner, who had been suffering for several days previously with constant nausea, but vomiting only after ingesting food or drink. Not regarding the case as a serious one, I simply interdicted the ingestion of anything but milk mixed with lime-water in moderate quantities, and ordered the oxalate of cerium in three-grain doses every three hours. This proved sufficient, and she resumed her accustomed diet in a few days. My attendance ceased on the 27th. She was three and a half months in her third pregnancy. She had aborted at about the same period of the two preceding pregnancies, but had not during either of them been annoyed with any nausea. The alleged cause of this attack was fright, and to a like cause she attributed the abortions. She is a corpulent woman, and was previous to this attack in good health.

On the eve of my departure to the meeting of the American Medical Association, at Buffalo (June 2), I was again called to see her, and found her suffering more than at any time during the first attack. She had taken the night before a purgative, consisting of blue mass and rhubarb, to relieve constipation. To this dose I attributed the recurrence, and supposing it would be relieved with the free evacuation of the bowels, I simply ordered pellets of ice at short intervals, and an effervescing draught of the granulated nitrate of cerium, but left directions that if the nausea and vomiting should persist, the oxalate of cerium should be resumed, and that failing the enemata should be given.

She continued to grow worse. The oxalate failed. A single enema, consisting of  $\mathfrak{z}$ ij of beef-tea,  $\mathfrak{z}$ j of brandy, five drops of laudanum, and thirty grains of the bromide, was administered, but occasioned so much pain and distress that she positively refused to allow a repetition. On Thursday the 6th her condition became alarming, and Prof. Kleinschmidt was summoned to see her. He furnishes the following memoranda:—

“On the afternoon of Thursday, June 6th, Dr. ——— came to me for the purpose of consulting me upon the case of Mrs. ———. After detailing the course and symptoms of her trouble, he stated, in reply to my question, that among a number of remedies that had been tried the last was potas. bromid. given per anum. It had to a certain degree controlled the attacks of vomiting, but he had not given the drug for several days, fearing that the great depression of the heart's action, which now was a prominent feature of the case, was, in part at least, due to its action.

"Upon visiting patient, found her in bed; her face was slightly mottled as if from passive congestion; head and feet cold, pulse 160, feeble and of low pressure. She complained of severe paroxysmal pain about the region of the ductus communis choledochus, and was troubled by frequent attacks of a violent singultus. Had vomited just before my arrival, indeed had done so at intervals of one or two hours all day and the preceding night. No tenderness upon pressure over umbilical and iliac regions. She was very despondent, thought she would never get well, etc. In view of the therapeutic history, which included nearly all the remedies suggested for this complication of pregnancy, I was at a loss to suggest with any reasonable hope of success in an intractable case as the present appeared to be. I finally proposed to give a trial to acid. hydrocyan., which was one of the remedies that had not as yet been used; suggesting the following formula:  $\mathcal{R}$ . Acid. hydrocyan. dilut. gtt. xij, potas. nitr.  $\mathfrak{z}$ ij, mist. menth.  $\mathfrak{z}$ vj. Dose,  $\mathfrak{z}$ ss every four hours. Patient to have ice and beef-tea in small quantities.

"Saw her again at 10 A. M. the following day. Taken altogether, her condition was somewhat improved. She had had a few hours of sleep, and had vomited but three times during the night, and twice since day-break. Complained, however, of a constant fullness about the rectum, with an indication to evacuate her bowels, but upon repeated attempts had failed to do so. Had taken three doses of the mixture. Pulse 140, slight improvement in arterial pressure. Dr. ———, to whom I made the suggestion, that, in view of the failure of the acid to absolutely arrest the vomiting, we had better give the bromide another trial, still objecting for the reasons already given, the present treatment was continued; without marked change in the symptoms until Saturday, when Dr. Busey returned from Buffalo; re-instituting the injections of potass. bromid. with the remarkable and gratifying results detailed in his history of the case. I may state that I saw patient but three or four times before Dr. Busey's return."

Such was her condition at my visit in the afternoon of June 8th. A vaginal examination, made during this visit, was unsatisfactory. The index finger could be only partially introduced, because of the exquisite sensitiveness of the ostium vaginae and spasm of the sphincter cunni, a condition not unlike that present in cases of vaginismus. It was impossible to determine the extent of the sensitiveness beyond the ostium. The uterus was depressed, the os seeming to press firmly against the pelvic floor. Flexion could not be detected, though it is not believed that there was any. Bi-manual examination was precluded by the condition of the genital canal, the thickness of the abdominal walls, and the aggravation of the nausea and hiccough by very slight pressure upon the abdominal surface.

At 6 P. M. (8th) an enema was administered, consisting of  $\mathfrak{z}$ ij of beef essence, thirty grains of the bromide of potash,  $\mathfrak{z}$ ss of brandy, and ten drops of laudanum, which was repeated at intervals of four hours until five had been given, then the intervals were lengthened to six, eight, and twelve hours successively. In some of the enemata milk was substituted for the beef essence. The first one occasioned considerable distress in the rectum, but with the aid of firm pressure to the anus it was retained, and the pain soon subsided. She vomited once several hours after the administration of the first enema, and when three had been given the nausea ceased. Nothing, except pellets of ice at brief intervals, was permitted to be taken by the mouth until after the administration of the fifth enema;

then rice-water, at first in quantities not exceeding a teaspoonful, was given at intervals of half an hour. After the expiration of several hours champagne in drachm doses was allowed. On the second day after the resumption of alimentation by the stomach, milk was substituted for the rice-water in limited quantity in the beginning, but increased as the convalescence progressed. As usual in these cases recuperation was slow. Sometimes weeks elapse before recovery can be considered complete. During this period great care is requisite in directing the gradual and prudent resumption of accustomed diet. My patient had no recurrence, but her convalescence was interrupted by the supervention of two phenomena which I had not observed in previous cases. Well-marked jaundice appeared several days after the cessation of the nausea, associated with tenderness in the region of the paroxysmal pain previously referred to which had continued unabated. This I ascribed to the presence of gastro-duodenal catarrh. After a free evacuation of the bowels, which was secured by a lavement of tepid water, the icterus, together with the concomitant symptoms, subsided. Subsequently she was seized with a violent pain, which she described as beginning behind the symphysis pubis and extending obliquely upwards across the left iliac region, continuous in character, but unaccompanied with any tenderness along its course or with elevation of temperature. It recurred at the same hour (4 A. M.) three successive mornings, and was relieved each time by an enema of thirty drops of laudanum.

In this case as in those previously published, stomachal alimentation was prohibited for a time, and only gradually resumed by the ingestion in very small quantities of unirritating and bland articles of diet. I, as well as those who have witnessed with me the cases reported, have ascribed the rapid amelioration and complete subsidence of the distressing disturbances of the stomach to the influence of the potassium salt in subduing the irritation supposed to be due to distension of the uterine structure. Salutary as this influence may have been, it is not improbable that it has been overestimated. It may be that the prohibition of stomachal alimentation, thus securing rest to that organ, was equally important, and, perhaps, an essential factor in the successful management of the cases.

Tyler Smith was probably the first to suggest the importance of affording rest to the stomach in the treatment of this affection, though in his case absolute abstinence from food was not practised. At the time he first saw the patient, a woman, aged 19, of short stature, and "represented to have been plump and in good condition" previous to the commencement of her sickness, two months before, she had so emaciated that she weighed but forty-seven and a half pounds.<sup>1</sup> He discarded all medication, and ordered one teaspoonful of milk and beef-tea to be given, alternately, every half hour. He insisted that it is "difficult or impossible for the stomach to reject a single teaspoonful of any bland, unirritating liquid, such as milk." This affirmation is too absolute. Cases occur in which the stomach will not tolerate anything, either solid or liquid. Occasionally,

<sup>1</sup> Trans. Lond. Obstet. Soc., vol. i. p. 335.

when some simple article of food is for a time retained, it simply accumulates, and is finally expelled undigested. Digestion seems to be suspended, or so disturbed that stomachal alimentation is impossible.

The nausea and vomiting of pregnancy are undoubtedly, in a vast majority of cases, reflex phenomena, but it is not improbable that occasional exceptions occur, and in a large proportion of, if not in all, the cases where these stomachic disturbances become serious and for a time uncontrollable, catarrhal conditions of the gastric mucous membrane are superadded. The clinical history of cases of acute gastric catarrh and of cases of protracted and uncontrollable vomiting of pregnancy are very analogous. Anorexia or a vitiated appetite, nausea, vomiting, thirst, epigastric oppression or pain, a saburral condition of the tongue, eructations of a glairy mucus, and despondency, are common to both affections. In fact there is not a symptom, except such as may relate to the reproductive organs, belonging to either which may not be present in the other. The most frequent cause of catarrh of the stomach is indigestion, due either to an indiscreet diet or to derangement of the digestive process. Impoverishment of the blood disqualifies the gastric fluids, and the inanition of pregnancy, so frequently the precursor of the more serious stomachic disturbances, may thus become a potential factor in their causation. This, however, was not so in the case presented, for there was no previous history of inanition, stomachic disturbance, or impairment of health, and the symptoms were sudden in their onset, and undoubtedly due to fright occasioned by the unexpected intrusion of a drunken man into the dwelling of the patient. Nevertheless, the subsequent history of the case establishes, presumptively at least, the presence of catarrh of the stomach, not however as the cause, but as the effect of the disturbance of the functions of the organ.

I am aware that in a majority of the post-mortem examinations of women who have died from this cause, no morbid condition of the stomach has been recognized, and that is true also of a majority of the cases of death from acute gastric catarrh. "Post-mortem pallor of the mucous membrane (Wilson Fox) is no sign of the absence of previous inflammatory action." This blanched condition may be due either to post-mortem contraction of the capillaries or to the action of the gastric juice.

"It is only," remarks Fox,<sup>1</sup> "when stasis has existed to an extreme degree, or when punctiform extravasation has taken place from the capillaries, that the signs of inflammatory hyperæmia persist long after death; and even when present they seldom, except in cases of extensive inflammations from irritant poisons, occupy more than patches of the surface."

Notwithstanding the absence of macroscopic changes, Wilson Fox claims the presence of a condition corresponding to that of "cloudy swelling," which Virchow has demonstrated in the kidneys and livers of pregnant

<sup>1</sup> Diseases of the Stomach, p. 133.

women. This he regards as the most characteristic appearance of catarrhal inflammation of the stomach, and he maintains, furthermore, that it arrests the "normal secretion of the gastric juice," and at the same time produces "a considerable amount of tenacious alkaline mucus."

In the case before us, the circumstance that fright in one instance produced uterine contractions, and in the subsequent pregnancy, at about the same period of gestation, excited reflex phenomena which culminated in such serious disturbance of the stomach, introduces the questionable influence of emotion as an exciting cause of the gastric disturbance.<sup>1</sup> Vomiting is a frequent complication of parturition, and difficult or depraved digestion, nausea and vomiting are not unusual co-attendants upon inflammatory conditions and malpositions of the uterus. When occurring during labor, the vomiting is probably always either reflex or emotional. When uterine ailments are complicated by stomachic disturbances, sooner or later inanition, too persistent to be ascribed to functional derangement, becomes associated. Sympathetic disturbances of the functions of respiration, circulation, and digestion, which control assimilation and nutrition, when long continued, seriously impair the general health and cause structural alterations. For a long time nervous vomiting has found a place among the numerous complaints of women, for the cure of which Semmola<sup>2</sup> has so successfully applied electricity, as Thomas<sup>3</sup> and Lente had, with equal success, to the treatment of the uncontrollable vomiting of pregnancy. The suggestion that this complication of pregnancy may be dependent upon structural alterations of the stomach is contradicted by the speedy efficacy of this agent in these allied affections, as likewise by the favourable result in instances of evacuation of the uterus, though unfortunately when artificially induced, death has followed in a majority of such cases.

It is not, however, my purpose to prove that gastric catarrh is a necessary cause of the nausea and vomiting of pregnancy, but to show its probable coexistence with these conditions when protracted, in order to establish upon pathological and therapeutic principles the correctness of the prohibition of stomachal alimentation as a remedial resource.<sup>4</sup>

<sup>1</sup> Cases have been reported by Andral, Hoffmann, Bassius, and Barry.

<sup>2</sup> Practitioner, July, 1878, p. 61.

<sup>3</sup> Medical Record, 1878.

<sup>4</sup> Since this paper was delivered to the editor, Dr. H. F. Campbell of Georgia has read before the American Gynecological Society a paper entitled "Rectal Alimentation in the Nausea and Inanition of Pregnancy," which will appear in the third volume of the Transactions of that Society. This paper relates more especially to the physiology of rectal alimentation, and incidentally to its value as a substitute for stomachal alimentation and medication in the management of the nausea and inanition of pregnancy; thus, practically, affirming the same view which I, looking at it from a different standpoint, have termed the prohibition of stomachal alimentation. Dr. C. seeks to establish the efficiency of nutrient enemata as the remedial resource, while I ascribe the benefit to suspension of the function of the stomach, while at the same time employing nutrient and stimulating enemata. In his study of the physio-

The study of these phenomena involves the consideration of the exciting causes and of the associated pathological conditions.<sup>1</sup> Various theories have been offered in explanation. Sympathy with the uterus; congestive inflammation and great tenderness of the os and cervix in the latter months; some irritable conditions of the cervix; ulceration of the cervix; morbid irritation of the uterus, and inflammation of the deciduous membrane; distension and evolution of the uterine fibre or pelvic irritation; displacements and flexions of the uterus;<sup>2</sup> compression of the tissues of the uterus; absence of liquor amnii, allowing contact of the fœtus with the uterine walls; inanition, and gastric catarrh have all had their advocates, but no one of these hypotheses can be accepted as sufficient. In our case the conditions were associated with fright and extreme hyperæsthesia of the vulvo-vaginal canal as co-operating causes.

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#### ARTICLE XV.

#### SUPRA-PUBIC LITHOTOMY; WITH THE HISTORY OF ONE SUCCESSFUL CASE.

By GEO. W. RACHEL, M.D., New York.

THE method of extracting a stone through an opening above the os pubis has of late found an ardent and able advocate in this country—Dr. C. H. Dulles, of Philadelphia. Since 1875 this gentleman has published several interesting articles on this subject, in all of which, I think, he has satisfactorily proven the preferability of the operation in question to that by perineal section. The following history will serve to give occasion for a few remarks on the subject, partly confirmatory of, and partly differing from, the views held by Dr. Dulles.

J. D., not quite five years old, was first presented at Prof. Jacobi's Clinic for Diseases of Children, College of Physicians and Surgeons, on August 14. His parents gave a history of bladder trouble, dating back at least two years. He had been examined for stone by several surgeons, but none had ever been found. For the last two months the boy's distress was intense; he was only able to pass a very few drops of urine at a time, and his agony before he could pass any quantity worthy of mention would last for fifteen or twenty minutes, sometimes even half an hour. His parents were extremely anxious to find relief for him as soon as possible.

No suitable instrument being at hand, I ordered him to come to my

logical action of rectal alimentation, it is probable that Dr. Campbell has, in a measure, been anticipated by Dr. Robert Battey of Rome, Georgia, who submitted to the Surgical Section of the American Medical Association, at the meeting at Buffalo, a paper entitled "Permeability of the Entire Alimentary Tract by Enema, with some of its Surgical Applications," a synopsis of which was published in the October No. (1878, p. 551) of the *Virginia Medical Monthly*.

<sup>1</sup> Monro, Obsts. Trans. Edinb., vol. iii. p. 94.

<sup>2</sup> Ibid.



office. He came there on the 16th, and, after having put him under the influence of chloroform—a task that proved rather unpleasant for reasons to be hereafter stated—I introduced a steel bougie, No. 7, English scale. As soon as the point had reached the neck of the bladder, and before I had fairly begun to execute the upward and downward curve necessary to complete the introduction of a sound into the bladder, I felt the stone grating at the tip of the sound; the scratchy feeling was experienced while the sound was pushed further in, although indistinct, and was gradually lost. Dr. Lilienthal, who happened to be present, also convinced himself of the presence of a stone; the conclusion drawn about its situation was this, that very probably it was partially lodged in the prostatic portion of the urethra, just at the neck of the bladder.

On the 21st of August all the gentlemen connected with our Clinic, except Dr. Jacobi, who was absent from the city, convinced themselves of the presence of a stone in the boy's bladder. Again it was found that the tip of the sound grated upon the stone just as the hand commenced to turn it from its first position during introduction into that which is obtained after the completion of such introduction.. On the 27th of August, I extracted the stone in the presence of Drs. Gerster and Huber, of this city, and Dr. Dulles, of Philadelphia.

The anæsthetic used on this occasion was ether, because, as alluded to above, the chloroform narcosis asphyxiated the boy in the most alarming manner. Only by grasping his feet, and inverting his whole body, and by resorting to artificial respiration, could I succeed in resuscitating him. But the action of ether proved similarly disagreeable. As soon as Dr. Gerster, who was kind enough to take charge of the anæsthesia, gave the boy a dose sufficient to produce full narcosis, he became thoroughly cyanotic, with gasping respiration, and all the other signs of incipient asphyxia. The doctor was therefore absolutely unable to put the child fully under the influence of the drug; a semi-narcosis only was safely admissible. This was a difficulty I had to contend with during the operation, as we were not able to control his movements sufficiently. The bladder, before the operation, was washed out, by means of a double catheter, with carbolic acid,  $1\frac{1}{2}$  per cent. solution, and then moderately filled with the same. The catheter was then withdrawn, and a steel bougie No. 9, introduced, of which Dr. Dulles, who advised its introduction, took charge with his left hand. I then proceeded to operate, beginning with a pretty free external incision ( $2\frac{1}{2}$  inches). After the bladder had been exposed, Dr. Dulles took hold of it with a good tenaculum, and depressed the steel bougie in his left hand so that its point showed itself plainly bulging up the anterior wall of the bladder. I then made the incision into the bladder, and immediately followed the knife with my left index finger, insinuating it into the opening so that only very little fluid escaped. As soon as I had thus prevented the bladder from collapsing I felt the stone whirling up against the tip of my finger. Without using any instrument, by a little manipulation I brought the stone out without the slightest difficulty. The peritoneum was not seen; hemorrhage was trifling.

The external wound was not a very neat one, in consequence of the restlessness of the boy, which made it impossible to keep exactly in the median line. It was closed by seven strong silk sutures. The vesical wound was not closed, but a double drainage-tube was inserted, such as first used by Trendelenberg, as I intended to try the abdominal position, first suggested and carried out by him. A small drainage-tube was also left in

the external wound at its lower angle. The wound was dressed with cotton batting saturated with carbolic solution, which was poured on half-hourly. The reaction on the first day was considerable:  $105^{\circ}$  F. in the morning, but only  $101\frac{1}{2}^{\circ}$  in the evening; next day,  $102^{\circ}$ , but after this normal. To keep the boy in Trendelenburg's position proved an impossibility; in the first place, he would always, instead of lying so that the wound was between the two hair-cushions and over the vessel placed there, move upwards, so that the wound pressed against the upper cushion; and secondly, he would try to rise and turn himself on his back entirely. I therefore removed the tube from the bladder and put him on his back with the injunction to change off to either side as little as possible. On account of his pain and his restlessness, as well as to retard his bowels, I gave him tincture of opium 10 drops every four hours, and it acted as I have seen it act very frequently, although I do not recollect having seen the action mentioned anywhere else; it stimulated his appetite into complete voraciousness! Everything went on satisfactorily; on the third day the first urine escaped through the urethra, while on the eleventh day, at 3 P. M., he urinated in a full stream, missing the vessel his mother brought to the bedside, and flooding the middle of the room with the contents of his bladder. On the twenty-first day the wound closed, and the boy is in excellent condition at present.

The stone is a uric acid calculus weighing 44 grains. It is biscuit-shaped and one inch long. The constriction separating the two portions, however, is not in the middle, the length of one portion being 3''' (and 4''' broad), while that of the other is 9''' (and 7''' broad). This peculiar shape is in accordance with the fact that the stone was located at the neck of the bladder. The probabilities are that the smaller portion occupied the neck and the prostatic portion of the urethra, while the larger extended back into the bladder, occupying its base, the strongest fibres of the sphincter by their contraction prohibiting a free deposit, thereby producing the deep indentation ( $2\frac{1}{2}$ ''' diam.). The fact that the boy, during the last months, suffered terribly—incomparably more than during the preceding years—also supports this view. He was sometimes in great agony for thirty or forty minutes before he could pass his water, which, during the last months, always came in drops and never in a continuous stream.

I must, however, mention the fact that a stone of very similar shape, only twice as large, which I saw while looking up the different collections in this city, seems to a certain extent to contradict my theory in regard to the origin of this peculiar shape. It is the calculus No. 796 in the New York Hospital Museum, to which specimen there is a record in the printed catalogue (page 315), prepared twenty years ago by the late Dr. Robert Ray, Jr. There the stone is rightly described as "of an hour-glass form," and it is reported that "lateral perineal operation was performed and a great deal of difficulty experienced in extracting the stone, as it was partially encysted upon the anterior wall of the bladder and so tightly constricted that a knife had to be used to liberate it." I am sorry that this report does not state which portion of the stone was encysted, although I think that even the smaller is too large to have been lodged in the neck of the bladder; and, furthermore, if the latter would really have been the case, we should have certainly found it so stated in the report.

I have found, however, still another specimen in the same cabinet, which strongly supports my theory. The number of this specimen is 793, and its description (page 314) is given as follows: "The stone (which weighs 1 oz. 6 dr.) is somewhat oval in shape, and its section is beautifully marked by concentric lines of different colors. *The nipple-like process seen at one end projected into the neck of the bladder, while the concave curve behind it rested upon the bas-fond.*" This nipple-like process very much resembles the smaller portion of the calculus extracted by me; the fact that it is larger finds its explanation in the circumstance that the specimen was removed from the bladder of a man of 18 years.

I have dwelt on this point somewhat longer than might seem called for, because in two meetings of two different bodies of medical men I have encountered opposition in regard to my theory of the origin of this peculiar and rare form of calculus. The principal objection raised by several able colleagues was that the stone could not possibly have remained at the neck of the bladder, as it would then have been utterly impossible for the boy to pass water. The case from which specimen No. 793 has been derived does, I think, invalidate this objection.

In conclusion, I wish to say a few words about some details of the operation as well as about its merits in general. In regard to the preparatory treatment of the bladder, I would say that the best way seems to be the following: *Wash out the organ* with a lukewarm solution of carbolic acid (1 to 2 per cent.) by means of a double catheter and a syringe. As soon as this is done, fill it moderately, ascertaining its position by percussion, *and then withdraw the catheter, substituting for it a steel sound*, or, if this is possible, *i. e.*, if the urine is retained in consequence of the chloroform narcosis, *do not introduce anything at all per urethram*. This was done in another case operated upon by me, which forms the basis of an article by Dr. Dulles in the April number of the *American Journal of the Medical Sciences*. I fail to see the reason why Dr. Dulles in this article condemns the use of the double catheter, which he advised in his first paper on the subject. He does not give any, as far as I can see, and did not object to its use at the operation herein described.

The integumentary *incision* should be a *large* one, as should also that made in the bladder. In the perineum, of course, the surgeon is desirous to make the wound as small as is feasible, since slow twisting, working, and pulling will often bring out a stone through an opening originally apparently much too small for the purpose. This is not necessary here. The larger the incision the quicker and the easier is the extraction consummated. The danger of infiltration—of which more anon—is thereby hardly increased, if at all; the danger of cutting the peritoneum is, however, lessened, and for this reason: the higher up the incision is prolonged, the more likelihood will there be to reach the peritoneum by careful dissection, and when seeing it, trust it to a reliable assistant to keep it out of

your way. The simple rule is that you only wound the peritoneum when it is hidden in the upper edge of the wound; find it, and you will not wound it. This rule, of course, applies more to adults, as the peritoneum in children covers much less of the anterior surface of the bladder than it does in the former. Lastly, the incision preferable in adults is the one parallel to the os pubis, and this may also be made pretty free without especial danger to the peritoneum on either side.

The cut into the bladder as first practised by Gunther is, according to my experience, the quickest, and at the same time the safest. Although Dr. Dulles makes it a special point that the bladder should be secured with a good tenaculum, and the point of the sound should be raised, and on it the incision commenced, I have the impression that it is just as safe to follow up the incision with the left forefinger. The latter (and not the stone) blocks the opening and prevents the escape of the fluid and the collapse of the organ. But even if the incision should be so large, that the fluid would find its way out, the finger in the bladder would suffice to prevent its complete collapse, and it could never be lost so as to cause serious embarrassment. Indeed, to my mind this feature of the operation illustrates better than any other its grand simplicity. No sound, no tenaculum, no stone-forceps: the finger—the *best instrument*—taking their place, and taking it successfully!

But, even if the finger, for some reason, should fail to extract the stone—although every calculus not too large and not encysted must and will be whirled up against the operator's finger—the secondary introduction of a stone-forceps or Günther's stone-spoon is a matter of little or no difficulty.

As regards after-treatment, I would say that the question, whether to *sew up the wound or not*, is still an open one. Günther, it is true, has had excellent results as compared with all previous statistics, perineal and supra-pubic, while leaving the wound absolutely untouched after the extraction of the stone. Yet, I am aware that several surgeons, among them Lotzbeck, Bruns, and Starr, during the last few years, have successfully sewed up the wound tightly, bladder and all, in one contiguous Lambert suture. I think that a surgeon thoroughly experienced in Lister's antiseptic treatment is fully justified in closing the wound in the bladder with cat-gut, and the external wound with an antiseptic silk suture.

As to *injections* after the operation to remove plugs of pus, mucus, and clots, I think they are justly condemned by Dr. Dulles, because they always require a gentle force, and even the gentlest under the circumstances is an undue force. Even when the wound is not closed by sutures, but left entirely to itself, I would advise against their use.

*Catheterizing* is necessary when the wound is tightly closed; otherwise it is superfluous, and the urine flowing over the wound does little harm, if any, because it has no time to decompose.

*Warm baths*, frequently repeated, have found an able and persistent ad-

vocate in Günther. I cannot say much about them, except that they may perhaps retard the agglutination of the tissues in the healing process, and as patients under equal conditions get well with, just as well as without them, I would not insist upon their use. Besides, they require considerable moving and handling of the patient, which perhaps might just as well be spared him; for the efforts which he involuntarily makes, when lifted, etc., always tend to contract his abdominal muscles, a thing specially to be avoided. A dose of opium, regularly continued, is a good preventive of the evil tendency just described, to which children by their natural vivacity are peculiarly liable.

A rapid survey of the advantages of the supra-pubic method recalls the following points:—

1. *A ridiculously small armamentarium.* (In average cases a pocket-case suffices.)
2. *Easy approach to the interior of the organ.* (A large wound, not a deep wound.)
3. *Easy apprehension of the calculus.* (No groping in the dark.)
4. *Easy extraction of the same.* (No pulling, tearing, twisting, dilating, lacerating, etc.)
5. *No destruction of important organs.* (No impotence, no sloughing of rectum, etc.)
6. *No hemorrhages* (neither during nor after the operation; only 2 out of over 500 cases on record, neither of which was fatal).
7. *No fistulæ* (of whatever description). It might be added that this is the only method of lithotomy where Lister's dressing may be fully applied, if the wound is sewed up (see above).

I think that these numerous advantages, almost every one of them a vital one, more than counterbalance the few disadvantages of this method that are again and again urged by its opponents, although having again and again been proved to have been always overrated.

I would like to divide these according to the stage of the operation in which they happen. During the operation there is a possibility of (1) *Protrusion of intestines*, and of (2) *Cutting into the peritoneum*. After the operation you have to fear (what just as frequently happens after perineal section), (1) *Peritonitis* and (2) *Urinary infiltration*. Dr. Dulles has shown that the fear of all this is, for the most part, imaginary. Of over 500 cases there was—

Protrusion of intestines in 13 cases, and of these 3 died.

Cutting of peritoneum in 14 “ “ 4 “

And furthermore—

General fatal peritonitis in 6 “

Urinary (fatal) infiltration in 7 “

I think that a careful perusal of this short review of the salient points *pro* and *con* in the discussion, concerning the merits of the “high opera-

tion," may perhaps encourage some of our readers to give this method a trial. All the advantages urged for the median operation are equally present in the supra-pubic. In children, at all events, this method is, it seems to me, *the* operation. Of recent operations, the one successfully performed by Dr. Starr, on a man weighing 200 pounds, a description and analysis of which Dr. Dulles gave in the *Amer. Journ. of the Med. Sciences* for July, 1877, is, I think, typical. The time is at hand in which such cases ought to be operated above the pubes *from the start, and not only after extraction through the perineum has failed*. Supra-pubic lithotomy is no "dernier ressort;" it is a first-rate operation, and ought to be recognized as such.

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## ARTICLE XVI.

ON FRACTURES AT THE LOWER END OF THE RADIUS. By JOHN H. PACKARD, M.D., Surgeon to the Episcopal Hospital, Philadelphia, Pa. (Read before the Surgical Section of the American Medical Association, at Buffalo, 1878.)

MORE than one hundred years ago, the distinguished French surgeon Pouteau wrote that fractures of the radius in the vicinity of the wrist, caused by falls on the hand, "are generally mistaken for sprains, for incomplete luxations, or for separations between the ulna and radius." This statement, which contains the germ of the modern ideas on this subject, seems to have had no influence at the time, and to have come to light again only as a matter of history.

In 1814 Colles, of Dublin, published in the *Edinburgh Medical and Surgical Journal* so clear and philosophical an account of these fractures as to have held its own, with scarcely any important modification, to the present day. His very modest article, however, attracted but little attention until brought into notice and enlarged upon by Mr. Robert W. Smith, also of Dublin.

Dupuytren followed, in a paper of uncertain date, but expressing views which must have been developed between 1819 and 1829. He was either unaware of Colles's publication, or chose to ignore it. What is still more remarkable is, that in 1847, Malgaigne, a very scholarly and comprehensive reader, and better acquainted than most of his countrymen with foreign books and journals, also passes over in silence the fact that Colles had written on the subject. Neither Voilemier nor Nélaton make any reference to it. These facts, however, need not surprise us so much when we note that Sir Astley Cooper makes no mention of Colles's name, and that it is barely alluded to by Fergusson. A long list of other names might be quoted did space permit.

The first American publication on the subject was by Dr. John Rhea Barton, of Philadelphia, in the *Medical Examiner* for 1838. His views were wholly theoretical, and have never yet, in forty years, been verified by dissection in this country. After him (excluding articles contained in systematic works on surgery, and that in Hamilton's *Treatise on Fractures and Dislocations*), no one dealt at any length with this topic until 1870, when Dr. E. M. Moore, of Rochester, N. Y., in the *Transactions of the New York State Medical Society*, published a paper urging the importance of the displacement of the ulna as an element of the injuries in question. In 1874 this was followed by an able prize essay from the pen of Dr. Thomas K. Cruse, of New York, in the *Transactions of the same society*. Lastly, Dr. Pilcher, of Brooklyn, in the *Transactions of the Medical Society of the County of Kings* for March, 1878, has discussed the matter, with some interesting practical and experimental details. Besides these four essays, I cannot at present (June, 1878) refer to any by American authors.

But neither the extensive foreign literature, nor the meagre list of writings by surgeons of this country, on the subject of fractures at the lower end of the radius, have placed it beyond discussion; and I therefore trust that no apology will be needed for offering some considerations in reference to it.

As to the lesions met with, it may be stated that in the great majority of cases *the principal line of fracture is more or less transverse*, and that when the fracture enters the joint it is generally by comminution of the lower fragment.

This statement is borne out by the study of museum specimens, and of recent dissections, as well as by clinical observation.

Again, we find that as a rule *the displacement of the lower fragment is a tilting up backwards*, so that the posterior edge of the upper fragment tends to run obliquely into the cancellous structure of the former, and the articulating surface is slanted backwards at an angle with the normal axis of the bone.

Sometimes there is a displacement backwards, with a very slight degree indeed of this tilting; the lower fragment being rotated slightly at its outer side, while the ulnar side is held fast by its connections with the ulna.

On this matter the testimony of museum preparations, and especially of old united fractures, is not always to be accepted without very careful study; since changes may have taken place in the way of deposits of new bone, and of absorption of fragments in the process of union, and in the later process of modelling, such as to wholly efface the characters of the original injury. Rigid scrutiny should also be bestowed upon clinical cases, since the difficulty of accurately making out the line or lines of fracture is sometimes very great, especially when the swelling of the soft parts

is such as to mask the bone. And in old cases, for obvious reasons, it is very hard to arrive at a satisfactory degree of certainty in regard to the exact lesion which may have existed.

Making allowance, however, for possible errors, we have enough assurance of these facts to draw from them the inference that *the great majority of these fractures are produced by leverage*. Additional testimony to the truth of this statement is derived from another source.

Sir A. Cooper, in 1833, made experiments on the dead body, carrying the hand back into extreme extension; the radius gave way, in one instance at the epiphysis, in the other just above that point. These experiments have been often repeated, by Voillemier, by Gordon of Belfast, by Cruse, by Pilcher, by myself, and very probably by others, always with the same general result.

Another method, adopted by Nélaton, Le Comte, and others, is to place the palm of the hand on a firm surface, and to strike heavy blows upon the elbow, or upon the sawn ends of the bones. In 1864 I made fourteen trials of this method, and in all obtained a transverse fracture, with comminution of the lower fragment.

The very great frequency of this transverse fracture, produced by falls on the hand, demands some other explanation than the impact of the carpal bones against the extremity of the radius. And such an explanation is found in leverage. Perhaps, however, the best expression for the mechanism of the injury is that borrowed by Gordon from another branch of science, "cross-breaking strain."

Pilcher, in the essay before mentioned, points out the fact that by a fall on the palm of the hand we may have various grades of injury produced, according to the severity of the force brought to bear upon the structures about the wrist. The ligaments and accessory fibrous tissues may be stretched and torn, constituting a sprain. To this may be added bruising or even fissuring of the bone, which, by a still greater force, would be carried to actual fracture. If the upper fragment is driven down into the lower, the latter may be comminuted in various degrees.

Here it may be mentioned that in this comminution of the lower fragment its posterior or dorsal portion is almost invariably involved.

When a man falls forward, alighting on the palm of his hand, the hand is pronated and extended to the utmost degree; the ligament and tendons at the palmar surface of the joint are stretched, and as the elbow is driven on by the momentum of the body, the leverage exerted comes on the bone, the palmar wall gives way, then the cancellous columns in succession, and then the dorsal wall.

If we notice a boy in the street, or a circus-actor, turning a hand-spring, we see that he puts his hands down everted and apart, so that the degree of extension at the wrist is limited, and his weight is really thrown directly along the axis of the radius, and through it upon the arch of the carpal bones.



I have been unable to find an account of any case in which fracture of the lower end of the radius has been ascribed to a fall with the hand on a line with the forearm.

Seven cases are on record of displacement of the lower fragment anteriorly, or tilting towards the palmar face. Three of these were seen by Callender,<sup>1</sup> one during life, with a clear history of extreme flexion of the hand at the time of injury. The other two were museum specimens. R. W. Smith gives a fourth, Hamilton a fifth, and there are two in the Museum of the New York Hospital, one of the latter being a cast and the other a dried specimen.

One specimen in the New York Hospital Museum seems to me strongly confirmatory of this view in regard to the production of these fractures by pure leverage. The fracture has not been quite complete; a splinter still connecting the lower fragment with the upper, but bent, as if ready to give way to further force.

It must be allowed, however, that there are cases which do not admit of this explanation. Such are the "stellate cracks," of which three are preserved in the Warren Museum, in Boston. In one of these, figured by Hamilton, a fissure extends (in the cut), about  $1\frac{1}{2}$  inch along the shaft.

Another lesion, difficult to account for except on the theory of direct violence, consists of a separation of a small portion of the lower extremity, the articular facet for the ulna being broken off from the rest of the bone. The explanation above suggested is favoured by the statement that one of the carpal bones is also broken. (N. Y. Hospital Museum, No. 128.)

Fractures are also met with by which the styloid process is broken off, an oblique line running into the joint. An excellent instance of this is in the Warren Museum in Boston, No. 4631. Callender mentions two London specimens. Hamilton thinks he has twice made out a fracture of this kind in the living subject; and many others of less authority as observers have claimed to have often seen such.<sup>2</sup>

In one case (N. Y. Hospital Museum, No. 127), and in a number of others, the styloid process is broken off, and the posterior lip of the articular end is also separated.

This leads us to ask whether there is such a fracture as that described by Barton and called by his name. This gentleman (*Philada. Med. Examiner*, 1838) says, that in the act of falling "the hand is instinctively thrown out, and the force of the fall is first met by the palm of the hand, which is violently bent backward until the bones of the wrist are

<sup>1</sup> St. Bartholomew's Hospital Reports, 1865.

<sup>2</sup> The case reported by Dr. Butler (*N. Y. Journal of Medicine*, 1867), in which a boy of 14 had the styloid process broken off and drawn upwards an inch and a half, is, I believe, entirely unique. The boy had fallen from a height of thirty feet; there was also a transverse fracture higher up. Union took place with the fragment in its abnormal position.

driven against the dorsal edge of the articulating surface of the radius, which, being unable to resist, gives way. A fragment is thus broken off from the margin of the articular surface of this bone, and is carried up before the carpal bones and rested upon the dorsal surface of the radius; they having been forced from their position, either by the violence or by the contraction of the muscles alone." He draws a distinction between this fracture and that described by Colles, whom, however, he does not mention.

Again, he says: "It sometimes happens, also, though rarely, that fracture of a similar character to the one just described occurs *on the palmar side* of the radius, from the application of force against the back of the hand while it is bent forwards to its ultimate degree."

One specified case only has been put on record of a lesion of this kind, but it does not appear that it was verified by dissection. Voillemier (*Arch. Gén.*, 1839) quotes it from Lenoir.<sup>1</sup>

Now, it seems to me clear that the greater the extension of the hand, the less the force brought to bear against the dorsal lip of the articulating surface of the radius. Moreover, the rounded shape of the proximal joint surface of the upper row of carpal bones would *a priori* exclude the idea of their having the wedge-like effect ascribed to them.

Still less possible would it be for force applied to the back of the hand during extreme flexion to produce an analogous chipping off of the palmar lip of the articulating surface of the radius.

It was before noted that in most cases of comminution of the carpal fragment the dorsal portion of it suffered. Such has been the case in every specimen of which I have knowledge; and I believe it may explain partly the origin of Dr. Barton's idea.

Here let me express my entire concurrence in the opinion stated by Callender, Pilcher, Cruse, and perhaps others, that the cause of comminution of the lower fragment is the driving into it of the lower end of the upper. Thus, Callender says, "Of nineteen of the fractures of the end of the radius which have been referred to, seventeen extend into the wrist, three of these from general crushing of the lower extremity of the radius, fourteen from splitting of the carpal end through the wedging in of the proximal portion of the shaft."

Taking now the leverage theory of the production of the transverse fracture, it is easy to see why the posterior portion of the lower fragment is sure to suffer in the comminution. And we have only to go a step farther to see how, examining only the living subject, Barton found his view borne out. Granting that he detected a fragment carried up upon the dorsal surface of the radius, before the carpal bones, it is probable that this piece was only one of several constituting the lower fragment, separated by a

<sup>1</sup> This particular year (1833) is wanting from the only set of the *Thèses Inaug.* to which I have access.

transverse breakage. Such a fracture as this could not justly be claimed as that described by Barton, since he expressly says that "the end of the radius itself occasions on the palmar side a prominence which is round and smooth, and differing in this from similar projections formed by the fractured ends of bones." Nor can fractures separating the styloid process with more or less of the adjacent bone be regarded as conforming to his description.

I must confess, moreover, my inability to see how, from a fracture merely of the posterior lip of the articular extremity of the radius, treated with ordinary skill or care, such bad results could ensue as Barton enumerates: "A crooked arm, deformities, rigid joints, inflexible fingers, loss of the pronating and supinating motions."

And although the views of this able surgeon have commanded so much respect in Philadelphia, and among those taught in the schools of that city, as to give a certain currency to the term "Barton's fracture," yet not a single specimen of it exists, nor has any one except the French writer before referred to stated positively any definite case in which it was even supposed to be detected. Barton himself never verified his theory by dissection. True, the lesion is not a fatal one, but neither is Colles's fracture, of which so many specimens can be shown.

I feel constrained, therefore, to express my belief that the views set forth by Barton as to fractures of the lower end of the radius are unsupported by facts. If such facts are attainable, they have eluded my search carried on for the past twenty years.

My endeavour so far has been to show that, with very rare exceptions, fracture of the radius at its lower extremity takes place by leverage, or, in the technical language of mechanics, by "cross-breaking strain." Perhaps it will not be regarded as too great a refinement, if I object to the terms "tearing off" or "avulsion" sometimes used even by those who accept in the main this theory.

The action of the ligament which is first stretched, and which finally causes the bone to give way, is like that of a rope attached to a bar, and pulled upon across the axis of the latter. The whole force is applied at an angle to the axis of the bone.

The symptoms of the injury in question need not occupy us very long.

First, concerning impaction, we find very opposite views expressed. Gordon says that in Colles's fracture it is impossible. Callender says that thirty-six specimens in the various museums in London show deformity, in all clearly due to "the impaction of the proximal into the distal end of the bone." Voillemier thought the impaction so marked a feature of the injury, that he would rank it among what he calls "fractures by penetration." R. W. Smith argues that the appearances which led Voillemier to this opinion were due to deposits of new bone.

With this question as to impaction is closely involved another, as to

preternatural mobility. In proportion to the closeness of interlocking of the fragments will this symptom be difficult to detect. Another circumstance tending to obscure it will be the nearness of the fracture to the wrist-joint. When it exists, I believe it generally, if not invariably, indicates comminution, and should prepare us for difficulties in treatment. When it is not readily felt, any attempt to develop it is rash, cruel, and unwarrantable. The other symptoms amply suffice, and if the fragments can be so moved upon one another as to effect reduction, the question can and will be settled when this procedure is undertaken.

It cannot be denied that many museum specimens show no impaction, but these are such as have been removed and cleaned from recent cases, in which no union has as yet taken place. Probably if examined carefully when fresh, with reference to this point, as were some of those mentioned by Callender, they would have told a different story. Certainly the irregularities of breakage noticeable in many of them, and the known difficulty of reduction in these cases generally, unless comminution has occurred, afford strong ground for believing that entanglement is the rule.

The deformity is perhaps kept up in great measure, as suggested by Pilcher, by the untorn periosteum stretched between the fragments on their dorsal surfaces, as well as by the portion of the anterior ligament passing obliquely from the styloid process of the ulna to the cuneiform bone. But these, it seems to me, can only have the influence attributed to them by reason of their agency in preventing the disengagement of the interlocked fragments.

Undoubtedly, however, the combined effect of the impaction and the tension of these fibrous structures is to prevent in many cases the occurrence of crepitus, and thus to mask what is too often thought an essential evidence of fracture.

Nothing need be said, in the way of description, of the deformity in these cases, since it has not only been often and thoroughly set forth, but is a matter of common observation with practical surgeons.

Let me, however, note that R. W. Smith and others regard the action of the muscles as the cause of the symptoms; and Erichsen refers to a case dissected by him in proof of the correctness of this view. That the tendency of the muscles would be to maintain it, cannot be doubted; the hand, at the moment of receipt of the injury, is pronated, while the fracturing force tends to twist the lower fragment up into supination. The upper fragment would be held in pronation by the pronator teres, against which the supinator brevis would, perhaps, not exert any efficient counter-action. But the pronator quadratus is probably, in many instances, as in several mentioned by Callender, so torn, and so separated from its radial connections, as to be powerless.

In cases where the lower fragment is not comminuted, I believe that the accurate adjustment of the fragments, and their retention in this rela

tion, suffice to overcome any muscular force which would tend to their displacement, and this is of great importance in the matter of treatment.

Mention has been made of the views of Dr. Moore, of Rochester, as to the ulnar displacement, which he would rank as the principal lesion. Upon careful examination of his paper, I find it impossible to look upon this idea as a tenable one in regard to the majority of these fractures. I cannot but consider the luxation of the ulna as a mere symptom, and not a very constant one; although it may be admitted that when it exists, it calls for careful attention. But this will be again referred to in connection with treatment.

There is one constant symptom, which may be very important, as affording a ground of diagnosis between a mere sprain and a fracture; I refer to pain on pressure. Whenever, after a fall on the hand, with injury severe enough to call for surgical care, there is pain at a certain point in the bone near the wrist, so that as often as the fingers of the surgeon are passed along the bone and come to that spot the patient winces, there is reason to suspect fracture, even although there is no displacement or other sign. And I firmly believe that it is safer, for surgeon as well as for patient, to deal with such a case as if the bone were clearly perceived to be broken.

Finally, we have to consider the proper method of treating fractures at or near the wrist.

In regard to this very important matter, as well as to the amount of success which may be hoped for, authors have greatly differed. Some represent reduction as extremely difficult, in many cases impossible, while others look upon it as simple and easy of accomplishment. By some we are advised to put the whole forearm and hand in rigid confinement with splints and compresses; by others we are assured that circular constriction of the wrist only is needful. Some claim to obtain, as a rule, perfect cures; others assert that deformity and disability are left in almost all cases. Diversities of this kind certainly show that the subject will bear further discussion.

The general principles of the treatment of fractures must not be lost sight of here. Deformity, when it exists, should be remedied, and the fragments restored as exactly as possible to their normal relation. Means should next be applied to keep them efficiently supported until union has taken place. During the time required for this process, constant care should be given to prevent subsequent trouble, by the early institution of passive motion, by frictions, by keeping the skin in a healthy state, and by gradually restoring the freedom of the hand.

No matter what may be the issue of a case, if the surgeon has carefully and conscientiously carried out these cardinal rules, he will have nothing to reproach himself with. He cannot command success, but he will have deserved it.

1. As to reduction. Callender says, "in a great number of cases the impaction so fixes the fragments that they cannot be unlocked, and the deformity is permanent."

Colles, on the other hand, says, "If the surgeon lock his hand in that of the patient, and make extension, even with moderate force, he restores the limb to its natural form, but the distortion of the limb instantly returns on the extension being removed."

Sir A. Cooper thinks powerful extension is required, but that the deformity recurs the moment that it is relaxed.

Dr. Moore thinks that if the head of the ulna is disengaged from the annular ligament and tendon of the extensor carpi ulnaris, the whole difficulty is overcome.

Pilcher, ascribing the obstinacy of the displacement to the untorn periosteum on the dorsal surface, advises that the hand be carried backward.

Impaction, dislocation of ulna, dorsal periosteum, muscular contraction—reduction impossible, reduction easy, reduction easy but deformity at once recurrent—how are we to reconcile these opinions, or how choose between them?

I cannot but believe that the truth will be found in recognizing the fact that cases differ. Sometimes the impaction will offer the main obstacle; sometimes the tense dorsal periosteum; sometimes obstinate muscular contraction, in which case complete anæsthesia will solve the problem.

Sometimes the luxation of the ulna will totally prevent the restoration of the radial fragment; but as this is not present in all cases, nor even in a large proportion of them, I cannot think it can be looked upon as the usual cause of the difficulty of reduction of the fracture.

Sometimes the great bar to replacing the lower fragment is the want of purchase upon it. By extension applied to the hand, we only succeed in stretching the carpal ligaments, but do not really pull upon the bone. In these cases we must at the same time make extension, and try to apply pressure to the fragment, so as to rock it loose, as it were, from the surface against which it rests.

And although, as already said, the untorn dorsal periosteum does not seem to me to be always in fault, the practice based upon that idea by Pilcher does seem to me to be correct—to make extension with the hand bent backward as far as possible, so that the fragment may go back as it came. This, with the circumduction of the hand recommended by Moore, certainly holds out the best promise of success. During any manipulation of this kind, the patient should be fully etherized.

One word as to the cases in which the deformity recurred at once after removal by extension applied to the hand. I cannot but think that here the displacement was not really overcome, but only seemed to be so. The reasons for such a belief will probably suggest themselves at once; the extension, bringing the fibrous tissues, dorsal and palmar, to bear upon the

lower fragment, would lessen the angle between it and the upper, and in a considerable degree restore the outline of the part. The real interlocking of the fragments, however, remaining unchanged, the deformity would at once recur in proportion to the slackening of the extension. Such an extension, even if kept up permanently, would utterly fail to give a good result.

When reduction of a fracture near the wrist has once been completely accomplished, by placing the hand in a position of extreme extension, and then drawing upon it so as to free the lower fragment, this manœuvre being accompanied if needful by circumduction of the hand, or by gentle manipulation of the fragment, the width of the surfaces placed in contact, their irregularities, and the pressure of the surrounding fibrous tissues, all tend to prevent any recurrence of the displacement.

The importance of complete reduction cannot be too strongly insisted upon. Until the fragments are accurately restored to their normal relation, it is useless to apply the best apparatus that could possibly be devised.

2. As to the retention of the fragments. Here again we meet with widely diverse teachings. I shall not undertake to enumerate all the splints that have been proposed, but would simply point out what it seems to me essential to do in order to obtain the best results, and how this can be best done. Let me say first of all, that one of the greatest mistakes that can be made is to think that the use of this or that splint is going to insure success.

Above all things let the surgeon in every case consider what are the requirements with which he has to deal, and adopt his measures accordingly. This only is scientific surgery; anything else is mere routinism.

Reduction having been effected, the forearm will be restored to its normal contour. Comparing which lines with a straight line, it is clear that if flat splints are used, they must be padded so that the surfaces applied to the palmar surface of the forearm shall correspond to the latter. And I think it will also be admitted by most surgeons that this is very seldom done; that the compresses employed are apt to be either too small or too soft. Another point which often, perhaps generally, has escaped notice is the difference, very marked in muscular adults, but plain even in the forearms of children, between the radial contour and the ulnar, so that the radial edge of the compress should be much thicker near the wrist than the ulnar.

The difficulty of arranging these compresses accurately, of getting them of the exact size, shape, and thickness required, and above all, of preventing them from either flattening down or shifting, must be recognized as a valid objection to their use.

Hamilton's plan of enveloping the splint in a loose sack, between which and the splint curled hair is inserted and shaped so as to form the com-

presses, is certainly the best and safest form in which mere padding can be employed.

Bond's splint, as generally used, merely lined with cotton, the hand bent up backward over a large palmar block, has no doubt been a most fruitful source of permanent deformity in these cases. The size and shape of the block renders stiffening of the fingers almost inevitable. To fit this splint for effective use, the palmar block should be cut away at either side so as to give it nearly the shape of half an egg; the leather sides should be removed, and on the upper surface of the splint itself, at the radial side, a piece of wood should be fastened, so shaped as to suit the normal concavity of that portion of the forearm.

Dorsal compresses, as well as dorsal splints, may as well be wholly dispensed with. They can do no good if the reduction of the fracture has not been thoroughly accomplished, and if it has, they are needless.

But the object aimed at in the use of compresses can, in my opinion, be much better effected by means of a properly shaped splint. That devised by Coover, of Harrisburg, Pa., has answered extremely well in my hands. The one proposed many years ago by Carr, of New Hampshire, has the great merit of being easily made with a few slips of wood and a piece of broomstick; but it seems to me to require some modification, the neck, if I may so call it, being too long, and the graduation in thickness being imperfect.

Whatever form of splint is employed, there may be great advantage, as union becomes firm, say about the second or third week, in cutting away the hand part, and leaving simply the support to the wrist.

For covering these splints, or any others which are accurately adapted to the surface, I think two layers of canton flannel, or of ordinary woollen flannel, greatly preferable to cotton, which is very apt to become sodden and lumpy with perspiration.

One important point may be mentioned in this connection. The same rule should be observed here as in other fractures—frequent examination and early passive motion. Malgaigne made the extraordinary statement that after dressing a fracture of this kind, his practice was to leave it undisturbed until the eighteenth or twenty-second day, when he would ascertain the condition of things, and remedy any displacement that might have occurred. In this era of suits for malpractice, such an example could hardly be safe to follow.

Much stress has been laid by some writers on the necessity of adduction of the hand, so as to force the ulna into its place, and prevent the lower fragment of the radius from riding up over the upper; and various devices, from pistol-shaped splints to the mere weight of the hand, have been resorted to under this idea. Nothing need be said of them, except that they are useless if the fracture has been completely reduced.

Lastly, we are told by Dr. Pilcher that we ought to abandon all splints



in the treatment of Colles's fracture, and content ourselves with a broad strip of adhesive plaster around the wrist. Dr. Moore advises merely a compress and bandage. Both these gentlemen claim to have achieved constant and perfect successes by no other means. Without pretending to cast a doubt upon their statements, I must confess that were my own wrist the seat of such an injury, I should be unwilling to trust such seemingly imperfect protection; and that before taking the chances of unpleasant results in practice, I would make very cautious experiments under such circumstances as would enable me at once to detect and repair the mischief which I should certainly dread.

As to the degree of success which may be looked for in the treatment of Colles's fracture, I can only say that there seems to be reason to believe that the average of results is better now than it was twenty years ago, and to hope that further improvement is in progress.

Nothing must satisfy us, in this or any other department of practice, short of the very best attainable results. If we can get, in addition to the usefulness of the limb, which Nature generally manages, a complete restoration of form, we ought not to be content unless we use the means, the care, and the skill, which will secure this advantage to our patients. Nor should this standard be adopted only for certain cases where deformity would be especially mortifying to its subject and discreditable to the surgeon; it should be aimed at invariably, in hospital practice as well as in private, in the poor as well as in the rich.

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#### ARTICLE XVII.

A CASE OF CHOLECYSTOTOMY, WITH REMARKS. By W. W. KEEN, M.D.,  
Surgeon to St. Mary's Hospital, Philadelphia.

FOR the following history I am indebted to Drs. Bonifil and Ewing, the Resident Physicians of the Hospital, and to the courtesy of my medical colleague, Dr. James Simpson, for permission to use it.

Mary H., æt. 60, Irish, married, has had six children, was admitted to St. Mary's Hospital, service of Dr. Simpson, October 16, 1878. Her general health had always been good until six months ago, when she began to have a dull, aching pain in the back, between the shoulders and in the left hypochondriac region. This continued for about two months, when she began to have a sharp, shooting pain in the right hypochondriac region, loss of appetite, vomiting, constipation of the bowels; and in a short time became jaundiced. The vomiting continued quite constantly for six or seven weeks. The jaundice became deeper, appetite continued poor, and bowels constipated, vomiting frequent, stools clay coloured, and urine darkly coloured, until admitted to the hospital.

*Present condition* (October 16th.)—Emaciated, intensely jaundiced,

almost mahogany coloured, and has a worn, pinched expression. Suffers from a dull, occasionally shooting pain in the right hypochondriac region, and sometimes in the left side and back. She has no appetite, and can take no solid food without vomiting; can take milk better, but sometimes vomits that; bowels constipated, and, when opened, the stools are clay coloured. The urine is very dark. Suffers very greatly from itching all over the body, but not enough to prevent good sleep. Everything she looks at is tinged with green. A white shirt bosom especially is quite green to her eye.

The liver is somewhat enlarged, and lower than usual, the dulness extending from the seventh rib to two inches below the border of the ribs, and below it can be felt a soft fluctuating mass, globular in form, about 4 or  $4\frac{1}{2}$  inches in diameter, reaching to about half an inch above a line drawn across the abdomen from the crest of the ilium.

*Treatment.*—R. Sodii bicarbonat. gr. iv, Acid. tartaric. gr. iv, every three hours.

17th. Vomits less frequently.

18th. The tumour has enlarged perceptibly, and is now about 5 inches in diameter. A hypodermic syringe was used as an aspirator, and 5ss of dark fluid drawn from the tumour. Nitric acid shows that it contains bile. Suffered much pain after the aspiration. Morph. sulph. gr.  $\frac{1}{4}$ , hypodermically.

19th. Suffers still a good deal of pain when the hypodermic point was passed, and there is slight tenderness on pressure.

20th. Pain better. Bowels opened, and the stool found to be dark greenish, watery, somewhat resembling tea.

21st. No pain; feels more comfortable. Stool dark and more natural.

26th. To date, condition about the same. At Dr. Simpson's request, Dr. Keen saw her in consultation with a view to aspiration. In view of the pain before experienced, it was not thought best to use an aspirator needle, but a hypodermic point was attached to the aspirator, and plunged into the tumour; 3x of dark fluid was drawn off, when no more could be obtained. Morph. gr.  $\frac{1}{4}$ , hypodermically. No palpation of the gall-bladder was made for two days, lest a little fluid should be pressed out of the tumour and cause peritonitis.

27th. Very sharp pain in the tumour, and some tenderness on pressure; moderate tympanites is now present. Bowels not opened. Temp.  $102^{\circ}$ .

28th. A careful examination was made for stone in the gall-bladder, but none could be found. Suffered much pain afterwards. Tongue dry. Temp.  $101^{\circ}$ . Stool clay coloured.

29th. Pain and tenderness almost entirely disappeared. Feels much better.

Nov. 3. Transferred to the Surgical Ward. Has been feeling much better for the last two days; less vomiting; no pain; sleeps fairly well; tympanites persists; temp.  $98.4^{\circ}$ . The tumour has enlarged since the 26th; measures  $5\frac{1}{2}$  inches in diameter each way, and extends now from the median line to the right flank, and from the liver border to the groin, filling the entire right half of the belly. It can be readily grasped by one or two hands on depressing the belly wall; is globular, fluctuating, moderately tense, and moderately tender.

*Operation.*—After consultation, an exploratory operation was decided on, and was done at 1 P. M., November 4th, with the usual antiseptic precautions. Present, Drs. Grove, Mears, Koerper, Roberts, Ewing, and

Bonifil. An incision was made, about three inches long, parallel with and two and a half inches to the right of the linea alba, beginning three-quarters of an inch above the level of the umbilicus, and over the most prominent part of the tumour. Before incising the peritoneum, all bleeding was stopped, two ligatures and four artery forceps being used. The peritoneum being opened, the lower border of the liver was seen projecting for nearly an inch. It was pulled up by a retractor, and the tumour was then seen as a spherical mass. No one was allowed to pass a finger into the abdominal cavity but myself, as I wished to add no possible risk. I passed a finger in and traced the tumor readily up to the under surface of the liver, the large globular mass becoming somewhat sausage-shaped. The choledoch duct was not felt. Two points of adhesion to the omentum were found at the lower part of the tumour, both slight, both recent, and neither was disturbed. At no time was the omentum or the bowel even seen in the wound, except once, when vomiting threatened to cause the intestine to protrude. Pressure readily prevented this, and the bowel receded into the abdominal cavity. Several ounces of bloody serum escaped from the peritoneal cavity. It was of a slightly greenish colour. The liver, gall-bladder, intestine, and belly wall in the incision were all of a dirty-yellowish or brownish-green. A large aspirator needle was introduced into the gall-bladder, and  $\text{℥vii}$  of a dark brown fluid were removed. No more would flow, yet the gall-bladder was evidently nearly as tense as ever. It was seized by a double-hooked forceps, and an incision of one and a half inches made into it; a scoop or half-funnel used to carry off the water in syringing the ear being held under the opening, in order to carry off all the contents of the tumour without any escaping into the belly. I had punched a series of small smooth holes in its base, intending to pass a thread through the wall of the tumour, and tie it fast to the scoop before opening it; but the thread broke on tying, and I abandoned any further attempt at fastening it, as I did not wish to lose any more time, nor to pass another thread, as I found that the wall of the cyst was very vascular, the slightest puncture bleeding considerably. The threads already there were used later as sutures. The scoop was simply held in place, its flange being pushed into the abdominal opening, and the opening in the gall-bladder was held in place over it by the forceps. The walls of the tumour could not be drawn out of the abdominal cavity, the fluids which had been already aspirated not having relieved the tension sufficiently. The scoop, therefore, answered admirably, for otherwise a large amount of the contents must unavoidably have passed into the belly.

The wall of the gall-bladder was moderately thickened. As soon as the gall-bladder was opened it was plugged from within by an apparent clot, which was of a deep black colour. I inserted my finger, and found the bladder filled with a mass resembling in its feel a recent soft clot in the uterus. By the finger it was broken up, and in larger and smaller masses was scooped out through the opening, amounting in all to  $\text{℥xij}$ , making  $\text{℥xxx}$  of contents obtained from the tumour. No gall-stone was found. The lower wall of the tumour had now contracted, and was seen through the opening. A bullet probe was passed upwards for a distance of six or seven inches, and the interior thoroughly but cautiously explored. Nothing was learned except that the wall was smooth, and no stone was to be felt. It was uncertain whether the cystic duct was closed or open, as I could not be sure that the probe had entered it. Nor did the finger reveal more. The opening in the gall-bladder was therefore secured to

that in the belly wall by eight sutures of carbolized silk, and at the upper angle one hare-lip pin, all passing through the entire abdominal wall, including the peritoneum. Before this was done, careful search was made for bleeding vessels, and a little blood was removed from the belly by carbolized sponges. The cut wall of the gall-bladder bled considerably, and also the outer wall of the incision—not from any vessels, but by continuous and troublesome oozing. One small vessel spirted also from the inner wall of the bladder close to the cut. A long acupressure needle was therefore passed, including the outer wall of the incisions in both the belly wall and the gall-bladder, and a loop of wire was tightened over it. This stopped all bleeding. The fistula in the gall-bladder was left open, two carbolized sponges being placed below it to absorb any discharge of biliary matter (none of which had so far appeared), and the whole was then dressed in the usual antiseptic method. The operation lasted one hour and ten minutes.

After the operation she suffered a good deal from shock, became cold, and almost pulseless. Whiskey was given, and hot bottles applied to the legs and body. In about an hour she had revived, and was doing pretty well; suffered from pain in the wound; vomited frequently. Morph. gr.  $\frac{1}{4}$  hypodermically.

7 P. M. Dr. Ewing found the dressing saturated with blood. It was removed, under the spray, and a half handful of clotted blood found under it. She had probably lost some eight or ten ounces. No one vessel could be found bleeding, but there seemed to be an oozing from the cut surface sufficient to make a little stream of blood flow from the wound. Ice was applied, which much diminished the flow, and stopped it entirely in about an hour. He passed his finger into the opening made in the gall-bladder, which was closed by a clot of blood, and there followed a stream of blackish fluid tinged with blood, about four ounces in all.

8.30 P. M. Her condition was only tolerable; pulse weak: does not seem much weakened, however, by the loss of blood; suffers no pain: temp.  $98.4^{\circ}$ . She has had whiskey  $f\bar{5}ij$ ; milk  $f\bar{5}ss$ ; lime water  $f\bar{5}ss$ ; every half hour since the operation. This is now given in smaller quantities and at more frequent intervals. Vomiting about every half hour.

11 P. M. No bleeding; still vomiting.

2 A. M. Morph. sulph. gr.  $\frac{1}{4}$ , hypodermically, as she was restless and suffered considerable pain; temp.  $98\frac{1}{2}^{\circ}$ ; pulse 100.

Nov. 5. 8.30 A. M. Very weak, almost pulseless, but surface warmer, and tongue moist. Vomited about every half hour all night. Remained in the same condition all the morning.

2 P. M. Whiskey  $f\bar{5}j$ ; milk  $f\bar{5}ij$ ; given by enema every hour.

She gradually became weaker, vomiting almost constantly until 1 A. M. Nov. 6th, when she died, 36 hours after the operation. *Post-mortem* by Dr. Ewing 15 hours after death. Rigor mortis marked; much emaciated; not so deeply jaundiced as when admitted to the hospital. An incision was made from the ensiform cartilage to the pubes, and a second across the hypochondriac region. There was no peritonitis. The entire contents of the belly without an exception were of a dirty but deep greenish colour. A recent clot was found that would represent about  $\bar{5}iv$  of blood. The liver, gall-bladder, and as Dr. Ewing supposed, the duodenum and common choledoch duct were removed with the part of the abdominal wall, including the incision. The liver was moderately enlarged, and very soft, and its capsule tore with abnormal ease. Its colour on section was a dirty

ochrish-green, and its disintegration such that no positive conclusion could be reached as to whether the bile ducts were dilated. The two hepatic ducts were dilated, so as to admit the forefinger. The gall-bladder was slightly adherent to the abdominal wall at the seat of the operation. It had shrunk greatly after the evacuation of its contents, was pear-shaped, and now measured six inches long from its duct to the base, and three and a half inches across the widest part just above the base. The cystic duct proper was not dilated. Most unfortunately the common choledoch duct just beyond the junction of the hepatic and cystic ducts was cut off. The inner surfaces of both the gall-bladder and the hepatic ducts were of the same general dirty greenish-ochre colour. A few points of slight ecchymosis were seen.

The two bottles, one containing the unmixed liquid obtained by aspiration of the gall-bladder, the other, securing clots from the gall-bladder after opening it (this last unavoidably mixed with some recent blood from the operation) were referred for microscopical examination to Prof. J. G. Richardson, and for chemical examination to Dr. Henry Leffman.

*Microscopical Examination.*—Dr. Richardson reports as follows:—

“The aspirated fluid contains a few plates of cholesterine and numerous altered (swollen and decolorized) red blood-corpuscles.

“The denser liquid is loaded with blood-corpuscles, plates of cholesterine, and brownish granular material, no doubt the débris of altered blood. Both fluids show the two bands in the green of oxidized hæmatin when examined under the micro-spectroscope.

“Experiments made to determine the destructive power of bile upon blood resulted as follows:—

“In a mixture of equal parts of fresh blood from my finger, and of bile removed at an autopsy eight hours previously, the red corpuscles were invisible after twenty minutes.

“Four drops of the same bile, added to a mixture of four drops of fresh blood in 60 m. of .75 per cent. salt solution, caused the disappearance of the red corpuscles in less than twelve hours. One drop of the same bile in a similar mixture produced no obvious effect after twelve hours' contact.

“Hence, if we discover well-defined red blood-corpuscles in a fluid supposed to contain bile twelve hours after it is drawn from the body (or twelve hours after blood has been mixed with it), we may conclude that the amount of hepatic secretion in the liquid does not exceed seven per cent. (6.66).”

*Chemical Examination.*—Dr. Leffman reports as follows:—

“The samples consisted of a dark brownish-black liquid in quantity about six fluidounces, and a reddish-brown liquid in quantity about twelve ounces, and containing numerous clots, some of them fresh blood clots, others very dark in colour. The first mentioned liquid was tested for the bile acids and bile pigment directly, but gave no results. Even upon evaporating a portion to dryness no satisfactory reaction could be obtained, and the absence of the characteristic substances of bile seemed probable. However, a more thorough examination was made, adding to the remainder of the liquid some alcohol, filtering and evaporating to dryness, treating with ether, and then exhausting the residue with absolute alcohol. This alcoholic extract on being carefully evaporated to dryness gave, with the usual test, a splendid colour, indicative of the presence of the bile acids, though in very small amounts. The liquid was clearly not normal bile. Of the second liquid a portion of the darker coloured clots was taken, and treated so as to extract the cholesterin. The quantity taken was about four

grammes, and the bulk of the mass about two cubic centimetres. The experiment indicated that the quantity of cholesterin was very small. I did not obtain from the above quantity an amount sufficient to determine the weight. The dark clots were, therefore, chiefly old blood clots and not partly inspissated bile. As a confirmation of this I also observed that the dark clots when exposed to the air reddened perceptibly as blood does from oxygenation on a similar exposure."

*Remarks.*—Originally proposed by Petit and later by Maunder and Hughlings Jackson, so far as I know this is only the second case in which cholecystotomy has been done. The first will be found in the *British Medical Journal* for June 8, 1878, p. 811. (See this Journal for October 1878, p. 565.)

In that case the patient, also a woman, æt. 45, suffered with persistent jaundice, clay-coloured stools, nausea and vomiting, and the most intense itching. This wore out the patient, and was not relieved by any medication external or internal, but disappeared after aspiration, when 5xxxij of a dark brown fluid were removed from the gall-bladder. One month later cholecystotomy was performed by Dr. J. Marion Sims. He removed 5xxiv more of a similar fluid, and 60 gall stones, and established a biliary fistula. The patient did well for a week, when general hemorrhages came on and she died 30 hours later with black vomit. Eighteen more sacculated gall-stones were found. The bile ducts in the liver were dilated. There was no impacted gall-stone in the common choledoch duct. No mention is made of the exact condition of the hepatic or cystic ducts, but after the gall-stones were removed from the gall-bladder a probe could be passed from the gall-bladder into the intestine.

The first question that presents itself in the present case is that of diagnosis. Was there obstruction, and if so what was the cause of it? There is no reason to doubt that there was a mechanical obstruction in the common choledoch duct. The deep and long-continued jaundice for over four months, the clay-coloured stools, the nausea and vomiting, the very persistent and annoying itching, and the distended gall-bladder, all observed during life, clearly pointed to this; while the distension of the gall-bladder and of the hepatic ducts positively determined at the post-mortem point to the common choledoch duct as the seat of the obstruction. The unfortunate accident which precluded any examination of the common choledoch duct leaves us in doubt as to its cause, whether an impacted gall-stone, or inflammatory thickening, or occlusion. From the absence of any history of biliary colic, and the gradual onset of the disease, it was most likely not a gall-stone. No tumour was found that could have occluded it by pressure.

The second point for discussion is the symptoms. Dr. Sims correctly quotes Murchison as asserting that itching is uncommon except in jaundice from mechanical obstruction. Frerichs says it is present in one-fifth of the cases, but makes no mention of its relation to mechanical obstruction. Watson mentions it as present at the beginning of an attack of jaundice, but is also silent as to any special significance to be attached to it. I have examined several other authors, and find usually no mention made of it. It is a point of great importance if it be true that it is in any sense

the obstruction, whether it be inflammation or a gall-stone. For if a gall-stone it might possibly have been removed, or if inflammation, the relief of the tension might have allowed it to subside, and the duct to become pervious; and even if these results had not been obtained, the dangers of an operation and a permanent biliary fistula are at least not greater than those of continued obstruction.

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#### ARTICLE XVIII.

DOUBLE LIGATION OF THE INTERNAL CAROTID ARTERY IN 1869, by Dr. A. T. LEE, deceased, formerly of Kingston, Tennessee. Reported by MERIWETHER LEWIS, A.M., M.D., President of the Loudon County Medical Society, Lenoir, Tenn.

As Louisiana was the pioneer State of the Union in the performance of Cæsarean section, and Kentucky of Ovariectomy, so to Tennessee is already accorded the honour of the first successful performance of the operation mentioned in the above caption—the internal carotid having been ligated by Prof. W. T. Briggs, of Nashville, in February, 1871.

An interesting little *brochure*, by Prof. W. K. Bowling, published in 1874, will be remembered, in which the priority of Prof. Briggs was definitely established; Dr. Sands, of New York, having ligated the artery in October, 1872, eighteen months subsequent to Briggs's operation.

From the new case related below, it will be seen that the internal carotid was ligated by Dr. Lee, of Kingston, Tenn., on the 31st of July, 1869, one year and nine months before Dr. Briggs's case.

On that day, David C. White, a miller, was wounded in the neck, at the angle of the lower jaw, by the large blade of a pocket knife, which penetrated to the depth of three or four inches, and injured the internal carotid. The integumentary wound was somewhat in the shape of the letter S. Alarmed by the tremendous jets of arterial blood, Dr. J. M. Denning, in whose drug store the stabbing occurred, immediately seized the man's neck and compressed the carotids. Happening to be close at hand, Dr. Lee promptly cut down upon the artery by the usual incision, exposed it by careful dissection, found the bleeding point, and applied a ligature on the proximal end of the artery.

The patient, who had fainted, now rallied, and severe arterial hemorrhage occurred, coming, of course, through the vertebrals, the opposite internal carotid, and the circle of Willis. A ligature was, therefore, immediately thrown around the distal portion of the injured vessel and arterial bleeding at once stopped. The patient was now pulseless, and death was considered imminent; but under prompt and energetic stimulation with whiskey and ammonia the circulation soon became good; respiration grew full and regular; and, at the expiration of fifteen minutes from the close of the operation, the patient spoke. He was confined to bed for five weeks.

In January, 1874, while temporarily acting as resident physician at the Oakdale Iron Works, Roane Co., Tenn., I frequently saw and conversed with Mr. White. At that time, however, no information in regard to the nature of the wound or of the subsequent operation had been obtained from professional sources; hence, but little interest was taken in the case. To-day, Oct. 5, 1878, I am informed by Mr. R. B. Williams, of this county (Loudon), that White is still alive, and engaged in running a saw-mill near Wartburg, in Morgan Co., Tenn. Mr. White has suffered and is still suffering from partial paralysis of the muscles of the neck—habitually carrying his head a little to one side.

Dr. Lee was a young man, an ex-surgeon, I have been informed, in the United States Army. He died not very long after the performance of this rare and formidable operation, which fact, together with his unassuming modesty, has thus left to a stranger's pen the not ungrateful task of putting on record his operation. The facts, as stated above, were fully corroborated by all the physicians of Kingston.

The only artery that could have been mistaken for the internal carotid was the external, but the numerous branches of the latter, its relations with the hypoglossal nerve, its great depth, and the relative position of the two vessels, preclude such an idea.

The operation was bold, brilliant, and at that time unperformed by any other surgeon. The late war did not furnish a single instance, although the common carotid was tied once for wound of the internal, but, of course, without success. ("Medical and Surgical History of the Rebellion," Part I, vol. II. p. 419.) Keith, of Aberdeen, Scotland, ligated the internal carotid by the Hunterian method, with a single ligature (*vide* "*Monthly Journal of Medical Science*," Edinburgh, May, 1851, p. 435), but Dr. Lee was the first surgeon on record to apply the double ligature—the method of Guthrie—to a wounded internal carotid.

For the above-mentioned facts I am indebted to my friends, Dr. W. T. Hope, of Chattanooga, Dr. J. M. Denning, of the same city, and to Mr. Lewis W. Lenoir, now a medical student at Washington City.

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#### ARTICLE XIX.

LITHOTRESIS AND VAGINAL LITHOTOMY. By ANNA E. BROOMALL, M.D.,  
Resident Physician of the Woman's Hospital of Philadelphia.

THE following case is of interest, not only from the rare occurrence of stone in women, but more especially from the manner of perforating the calculus:—

Susan C., aged 57, English by birth, and residing in central New York, entered the Woman's Hospital of Philadelphia, October 10, 1878. The only item of special interest in her family history was that a brother had suffered from attacks of gravel.



The patient stated that her general health had been good, but that she had suffered from dysuria during the greater part of her life. Menstruation began at the age of sixteen and ceased at the age of fifty-one. She married at eighteen and had given birth to seven children. Between the birth of the first and the second child she suffered from prolapsus of the uterus. She emigrated in her early married life, and since then had been residing in central New York, in a region where the water was hard, living for six years on a farm where the well-water was very strongly impregnated with salts. Eight years ago she had a sensation as of "something dropping," after which she had great difficulty in urination, but, under medical treatment, she was relieved. In the following year she had a severe attack of pain while riding, and afterwards the urine was bloody. Five years since she was examined by a physician, who told her that she had inflammation of the womb and neck of the bladder. At the menopause she suffered from severe pain in the abdomen. One year ago the vesical and rectal tenesmus was extreme, and she complained of a feeling of fulness and plugging of the urethra. She again sought medical aid, and was told that the symptoms came from retroversion of the uterus. Then, and for the first time, she noticed a sediment in the urine, and, fearing that she was suffering from stone, she submitted to another examination, and was assured that there was no calculus, but that the trouble came from the condition of the urethra. She obtained no relief, and last winter she consulted another physician, who told her that she had a tumour in the anterior part of the pelvis, but no opinion was given as to the nature of the growth.

Dr. Emeline H. Cleveland, who was visiting in the neighbourhood last September, saw the patient and recognized the presence of a large calculus which filled the entire bladder. The patient, notwithstanding her great exhaustion, was very desirous for an operation, and eagerly availed herself of the proposition to come to Philadelphia for treatment. Owing to Dr. Cleveland's ill health, the case was placed under my care.

Upon admission to the hospital the patient was very much emaciated; her countenance was haggard and complexion sallow; the tongue was thickly coated; the superficial veins over the entire body were distended; venous pulsation in the neck was marked, especially upon the right side.

Examination per vaginam revealed a hard and very firm body in the anterior part of the pelvis, extending further upon the left than upon the right side. The uterus was small, and was pushed above and behind the mass. The introduction of the sound three-quarters of an inch in the urethra revealed the presence of a stone, in fact the calculus could be seen through the dilated meatus. The sound could not be passed between the stone and the walls of the bladder, but the surface of the calculus which could be reached was rough and friable. The urethra was shortened, dilated, and directed forwards, so that it was necessary in order to introduce the sound to hold it at right angles to the patient's body. There was some incontinence of urine. The tenesmus was extreme. The patient was unable to void any urine except while standing, and even then with so much effort and with so much pain that her groans could be heard in distant parts of the hospital.

The specific gravity of the urine was 1015; it contained albumen, but, although repeatedly examined for pus, none was found.

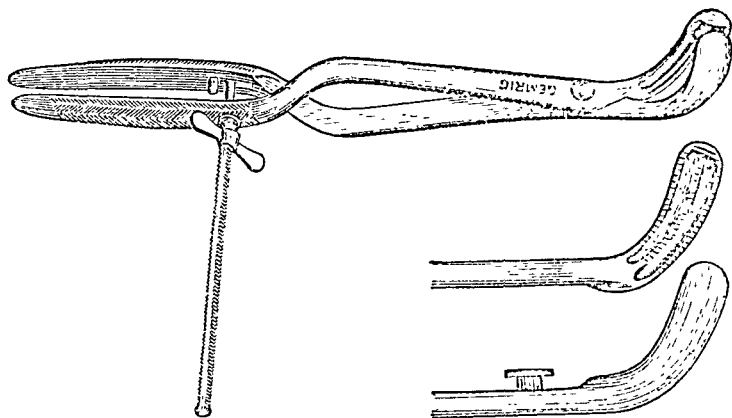
During the nine days previous to the operation the pulse ranged from 100 to 120. The temperature varied from 100° to 105° Fahr. The

patient's appetite was poor and her general condition was miserable, so that little beyond temporary relief could be expected from an operation.

It was decided in consultation to make a vaginal incision, crush the stone, and remove the fragments through the wound; and it was suggested by Dr. Albert H. Smith to break the stone by means of a drill rotated by Bonwill's dental engine.

A diamond drill was prepared specially for the purpose, consisting of a black diamond about a half centimetre in length, set lengthwise across the end of a steel shaft about ten centimetres long, with a sharp tip exposed, so that the perforations would be made of a diameter corresponding to the whole length of the diamond. This shaft, when fixed in the mandril of Bonwill's engine, as used in the hospital with an attachment for multiplying speed, could be made to rotate easily 10,000 times per minute, and would perforate any hard calcareous mass with great rapidity and with very slight pressure.

To secure a firm grasp as well as for crushing the stone easily after perforation, strong lithotomy forceps, as shown in the cut below, were made with separable blades to be locked after introduction, as in the obstetric forceps, and provided with an adjustable screw for gradual compression, to avoid the possibility of injury to the walls of the bladder by the sudden yielding of the stone.



*Operation.*—On Oct. 19th the patient was etherized and placed upon her right side, with hips elevated and thighs strongly flexed. After the introduction of Sim's speculum, I exposed the stone by an incision in the median line of the anterior wall of the vagina. The opening was four centimetres in length and extended in front to the vesical extremity of the urethra. The vesico-vaginal septum was thickened and œdematous, but there was little bleeding. I attempted to grasp the stone with the forceps, but I was unsuccessful, owing to the contracted state of the bladder and the impossibility of passing the blades between its walls and the stone, on account of the embedding of the rough surface of the calculus in the folds of mucous membrane. Other forms of lithotomy forceps were tried with no better success, until finally all efforts at grasping the stone were abandoned and reliance placed alone upon the hold of the bladder, which promised sufficient firmness to resist the feeble pressure made by the rotating drill. The edges of the wound were separated by retractors, bringing the stone into view, the surface of which was of a dirty-brown color and very friable. The portion exposed was riddled by a close

succession of perforations by the diamond drill, worked with the assistance of Dr. Bonwill. When a section was sufficiently perforated, it was broken up by a pair of bone forceps, and thus portion after portion of the stone was reduced to fragments sufficiently small to allow of their extraction, the largest being not over two centimetres in diameter. After getting an opening of sufficient size, the corundum burr was tried for the purpose of enlarging it, but was not successful on account of the hardness of the stone, especially of its nucleus.

The perforation and extraction occupied forty-five minutes, a greater portion of the time being consumed in repeated examinations for fear of injuring the bladder, time which was unnecessarily spent, as the condition of the vesical walls at the close of the operation proved. Careful examination of the bladder failed to detect the least laceration. The mucous membrane was found hypertrophied and gritty from particles of stone held in its folds, but its condition was in striking contrast to that of the lacerated and contused bladder of a patient operated upon in the hospital in June, 1876, where, after dilatation of the urethra, an ordinary lithotrite had been used to crush a stone of about the same weight, although in that case the greatest care had been taken to avoid injury.

After the extraction of the fragments of stone, the bladder was carefully washed out. The edges of the wound were cleansed, brought together, and united by silver sutures held by shot. Goodman's self-retaining catheter was introduced, and the patient put to bed. She reacted promptly, and did well until five days after the operation, when she had a chill, which was followed by great exhaustion, and she died three days afterwards.

The fragments of stone weighed 1935 grains. According to the analysis made by Prof. Bodley, the nucleus of the calculus was composed of oxalate of calcium, and the surrounding laminae of phosphate of calcium.

The urine for the first three hours after the operation was slightly bloody, it then became clear, and afterwards thick and ropy, which last condition continued until death.

The *autopsy* was made thirty hours after death. The left kidney weighed five ounces, and was found to communicate with the bladder by two distinct ureters. The supernumerary and smaller ureter had its origin at the lower extremity of the kidney. The two ureters opened in the bladder side by side. The inner surface of the larger ureter was studded with small cysts filled with a gelatinous substance, a condition which was found to be due to distension of the follicles. The pelvis of the kidney was distended with pus. The cortex was reduced, and the capsule was firmly adherent. The right kidney weighed four ounces, the capsule was peeled off with difficulty, and left a granular surface. The cortex was reduced. Several small calculi were found in the pelvis. The ureter was dilated at its lower extremity, and constricted at its middle portion.

The vaginal wound had united only half its length. The ununited edges were sloughing; one stitch had become detached. The entire mucous lining of the bladder was swollen and reddened. There were no fragments of stone in the bladder, and no evidences of laceration or contusion.

There is every reason to believe that the patient would have recovered had she not been suffering from chronic disease of the kidneys, for, notwithstanding the extreme exhaustion which necessitated a postponement of the operation from day to day until it was feared she would die before relief could be obtained, she recovered entirely from the effects of the operation, and died of chronic nephritis.

For the following references in regard to perforation of the stone after incision in the bladder, I am indebted to the kindness of Dr. John Ashhurst, Jr.:—

Mr. W. B. Dickinson, in the "History of a Case of Lithotomy,"<sup>1</sup> finding it impossible after an incision to grasp a very large stone, estimated to be the size of the globe of a large goblet, by means of the stone breaker, resorted to perforation on the recommendation of Sir Astley Cooper. The stone was held by a blunt midwifery hook, and a common small chisel was used to break the calculus, after which the fragments were extracted. The bladder was washed out. The pieces of stone weighed eight and a half ounces, and two ounces and a half of fragments were supposed to have been lost in the injections. The composition of the stone was mainly phosphate of calcium. The patient recovered with fistulous openings of the perineum. He had suffered for thirty years from symptoms of stone. The only point of interest in the convalescence was the sloughing of the recto-vesical septum sufficient to allow the escape of feces through the wound.

Mr. H. Earle, in "Remarks on the Danger of Extracting Large Calculi,"<sup>2</sup> reports a case occurring in Sir Astley Cooper's practice. The patient was forty-three years of age, and he had suffered from symptoms of stone for many years. An incision was made, but the forceps could not grasp the stone on account of its size. An unsuccessful attempt was then made to break it with a pair of strong forceps. It was then attempted to penetrate the stone with a gimlet, but with no better result. The wound was then enlarged, after which the calculus was extracted by the forceps. It weighed sixteen ounces.

Mr. Earle, after citing numerous instances of the extraction of large calculi, and considering the great mortality attendant upon such operations, concluded that it is much better to crush large calculi by some other mechanical contrivance than the forceps. He referred to instruments of various forms, all, however, with the object of crushing the stone by means of closure of the instrument, with the exception of the invention of Le Cat, which consisted in a perforator surrounded by a canula for protection of the bladder. Instruments of various sizes were to be used until the hole was sufficiently large to admit one which should break the stone by the forcible separation of its parts.

Civiale<sup>3</sup> recommends for the perforation of the stone the use of the *casse-pierre*, somewhat modified, consisting of lithotomy forceps furnished with a drill, the action of which will produce sufficient perforation of the stone to allow free crushing. He reported twenty-four cases in which the instrument was used with the result of five deaths and nineteen recoveries.

Thompson<sup>4</sup> refers to the custom in both London and Paris of employing

<sup>1</sup> Medico-chirurgical Transactions, vol. xi.

<sup>2</sup> Ibid.

<sup>3</sup> La Lithotritie et la Taille.

<sup>4</sup> Practical Lithotomy and Lithotrity.

in lithotomy some method of reducing the size of the stone when it exceeds four ounces, and he speaks of the instrument of Civiale as being the best for the purpose. He urges a careful consideration of the following difficulties which may be anticipated in crushing a large stone in lithotomy: 1st. The injury to the bladder from the manipulations necessary to fix the stone. 2d. The laceration and contusion of the mucous membrane of the bladder during the removal of rough fragments of stone. 3d. The manipulation and frequent washing out necessary to remove all particles of stone from the bladder. In lithotomy in women, however, the last objection is not of so serious consideration, as the bladder is more accessible and can be more readily washed out.

As a lithotrite a diamond drill has superior advantages from its small size, its rapidity of action when rotated by the dental engine, and avoidance of risk to the integrity of the bladder—advantages which strongly recommend its use upon stones too large to be safely removed through natural or artificial openings.

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#### ARTICLE XX.

#### THE MEDICINAL QUALITIES OF CAPON SPRINGS, WEST VIRGINIA.

By J. L. LE CONTE, M.D., of Philadelphia.

CAPON SPRINGS are situated in Hampshire County, West Virginia, on the western slope of the ridge of the Alleghanies, known as the North Mountain, along the crest of which runs the boundary between Virginia and West Virginia. The elevation is stated, in the published pamphlet recommending the medicinal qualities of the water, to be about 2000 feet above tide level; but I feel certain, from the vegetation of the surrounding hills, as well as from the general topography of the country, that this estimate is above the true position, and refers probably to the crests of the neighbouring hills. In the absence of barometrical observations, however, this must be considered merely as my individual opinion, unsupported by accurate knowledge.

The climate during the exceptionally hot summer of 1878 was moist, but not rainy. The showers were not frequent, and the clouds seemed to be attracted by the higher ridges to the south, east, and north. The days were warm, and though the thermometer in a well-shaded station, protected from reflection, rarely rose above 86° Fahr. at midday, yet the difference between the wet and dry bulb was usually not more than 3° to 5°. Exertion during the middle of the day was, therefore, oppressive, and the best time for exercise was early in the morning, before breakfast. The nights were generally cool, only three during the season having been exceptionally warm and unpleasant for sleeping.

The sources of mineral water are three, close together; two of them on the banks, and the third in the bed of a small stream which flows

through a narrow ravine in which the hotel is situated. This last-mentioned one is not now utilized, but can be used in future if a larger supply of water for the baths is needed.

The bathing-houses are large, and well supplied with hot and cold water from the main source. The second source, called Beauty Spring, is only a few feet from the main spring, and, as is shown by the analyses given below,<sup>1</sup> is not essentially different in its composition. The temperature of the springs is 65.5°, and the free gases are seen continually ascending in large bubbles.

It has been supposed by some persons, even of professional education, that the medicinal effects of the hot baths would be somewhat weakened by heating the water in the boiler. But I found on investigation that this view is illusive; for not only does a very trifling incrustation occur in

<sup>1</sup> These analyses were made, as I was informed, by Prof. J. W. Mallett, of the University of Virginia. "The following result was obtained on complete analysis, making the usual assumptions as to the distribution of acid and basic constituents. In all probability, the silicate really exists as soluble silicic acid, or a silicate:—

	GRAINS PER IMPERIAL GALLON.	
	No. 1. Main Spring.	No. 2. Beauty Spring.
Sodium carbonate . . . . .	.591	.631
Lithium carbonate . . . . .	distinct trace.	faint trace.
Calcium carbonate . . . . .	8.325	8.335
Magnesium carbonate . . . . .	1.441	1.269
Ferrous carbonate . . . . .	.041	.052
Manganous carbonate . . . . .	trace.	trace.
Cupric carbonate . . . . .	—	trace.
Sodium chloride . . . . .	.056	.054
Potassium sulphate . . . . .	.170	.163
Strontium sulphate . . . . .	trace.	trace.
Calcium sulphate . . . . .	.593	.408
Calcium phosphate . . . . .	.002	.002
Calcium fluoride . . . . .	trace.	trace.
Alumina . . . . .	.018	.015
Silica . . . . .	.707	.672
Nitrates . . . . .	trace.	trace.
Organic matter . . . . .	.204	.189
	<hr/> 12.148	<hr/> 11.810

## DISSOLVED GASES.

	CUBIC INCHES PER IMPERIAL GALLON. (60° F. and 30 inches press.)	
	No. 1.	No. 2.
Carbon dioxide . . . . .	8.57	7.81
Oxygen . . . . .	1.76	1.69
Nitrogen . . . . .	3.68	3.71
	<hr/> 14.01	<hr/> 13.21

## FREE GASES.

From No. 1, gas escapes in bubbles at frequent intervals, to the extent of about 300 or 350 cubic inches per hour. This consists of—

Nitrogen . . . . .	78.74
Oxygen . . . . .	9.02
Carbon dioxide . . . . .	4.38
Marsh gas . . . . .	7.87
	<hr/> 100.00

The specific gravity of the water was found to be—

No. 1	1.000.091	} at 15.5° C.
No. 2	1.000.088	

The temperature of the water is 65.5° F., showing the springs to be distinctly thermal.

The water from the two springs may be considered as essentially the same. It resembles in composition that of the Bethesda Springs, at Waukesha, Wisconsin."

the boiler, but the hot water is delivered at such a high temperature, that a comparatively small quantity is required to bring the cold water to any temperature capable of being endured.

It will be readily seen from the small quantity of alkaline carbonates in these waters, that in order to produce specific remedial effects, the waters must be taken in large quantities; this can be done without inconvenience, as the temperature is above that of ordinary spring water, and it is thus very rapidly absorbed from the stomach, and eliminated by the skin and kidneys.

The diuretic effect of the water varies greatly with different persons. Some were affected by four or five glasses a day, say a pint and a half, while in others no result was produced by less than eleven or twelve. I experimented carefully in my own person, and found the best results obtained by from eleven to sixteen, depending on the temperature of the day and the amount of perspiration. With these quantities, the urine became very copious and pale in colour; but I observed no special purgative effect on the intestines. I am the more confirmed in the correctness of this view, because of those patients who thought that they observed intestinal derangements proceeding from the use of the water, an equal number attributed to it laxative or constipating effects.

As to the proper time for taking the water, it should be drunk not less than half an hour before, nor one and a half hours after the meals. From three to four glasses can thus be taken before breakfast, and in the intervals between meals, or during the evening, without any inconvenience. The restrictions in diet will of course depend on the particular disease to be treated, and the individual peculiarities of the patient; minute directions, as well as the adjuvant medicines to be employed, must be properly left to the judgment of the medical adviser.

Now, as to the groups of disease in which the water has been found beneficial, they may be classed as (1) those affecting the urinary organs; (2) those of the digestive apparatus; (3) those of the reproductive organs of females.

In the first class may be mentioned: (*a*) renal calculi composed wholly or in part of uric acid, and cystic deposits of the same substance. Upon these the water has a wonderful solvent power, rounding the rough portions of the calculi, so that their passage along the ureters is attended with less pain. The action of the alkalis upon the agglutinating material also tends to disintegrate the larger masses. Upon calculi of oxalate of lime, ammonio-magnesian phosphate, and other abnormal deposits, the water will of course have no effect.

(*b*) Certain cases of cystic catarrh are greatly benefited by the irritating qualities of the urine being lessened; but in general these cases are obstinate and require the assistance of other remedies, both local and general.

In the second class, it is found that many cases of dyspepsia depending on too free secretion of acid in the stomach, or on a gouty diathesis, are relieved after a few weeks' use of the water.

Congestion and enlargement of the liver, especially if caused by long-continued derangement of the portal circulation, produced by miasmatic influence, are also relieved by free use of the water in conjunction with podophyllin, or other medicines which increase the secretion of bile. But it must be here remarked, that the quantity of alkalis in the water is so small, that by itself it will have scarcely perceptible effects in this form of disease. Nevertheless, being the most accessible alkaline water to the inhabitants of this part of the continent, I consider it, when conjoined with the medicines above indicated, and properly restricted diet, as a most valuable agent. The diet, especially if a tendency to fatty degeneration is suspected, should be modelled upon that used at Carlsbad, in Bohemia, and consists essentially in abstinence from fats, highly seasoned food, and stimulating or acid drinks.

In regard to the third class of diseases, those of the female reproductive organs, I can say nothing from personal observation, but by the kindness of professional friends am enabled to give briefly the results of their experience.

Cases of nervous derangement produced by uterine irritation have derived much benefit, and in one marked instance of epileptiform convulsions, the use of the water following upon a course of specific treatment has resulted in what is apparently a permanent cure. In the imperfect menstruation of young girls, and in chlorosis, the menstrual function has been regularly established. In these instances the effect has been probably due to the improvement of digestion, and the consequent assimilation of the normal amount of iron from the food. Attention to this point is not sufficiently given in the treatment of chlorosis; for it seems natural to suppose the absence of sufficient iron in the blood results primarily from a want of power to assimilate it from the food, and cannot be overcome by the internal administration of the compounds of that element. The power of the blood to convey oxygen can, if this view be correct, be increased only by restoring the faculty of extracting iron from the food, not by increasing the quantity taken into the body, but by producing such change in digestion and innervation as will enable it to be absorbed and assimilated from ordinary nutriment.

Finally, a word of caution as to the beginning of a course of this water. If taken at first in large quantity it will disorder the stomach, and produce febrile excitement. The proper way is, therefore, as in the use of other mineral waters, to begin with a few glasses, say two or three the first day, and gradually increase until free diuresis is produced.

By attention to the indications above given, and by a careful discrimi-



nation in the cases sent to this locality, I feel certain that few will leave the springs without being well satisfied with the results of their visit.

The rock through which the springs emerge is a light gray calcareous silurian sandstone of the Lower Helderberg group, containing rather poorly preserved specimens of *Productus galeatus*; about a quarter to a third of a mile northwest, and at a lower elevation is an iron spring breaking through slaty Devonian rocks of the Hamilton group. In a thin stratum at the side of the road are found excellent specimens of *Spirifer mucronatus*, and two other shells characteristic of that formation.

There is one important consideration which adds greatly to the value of Capon Springs as a sanitary station for invalids. As, however, it is of a moral and social nature, it could not properly find place in the brief account above given of the medicinal qualities of the water.

The hotel is the habitual summer resort of many families of cultivation and refinement, whose members outnumber the invalids to such an extent that the latter do not feel the depressing effects which result from the accumulation of patients in some sanatoria; and the beneficial effects of the water are not interfered with by too constant thought and conversation about disease.

The neighbourhood abounds in pleasant walks, rides, and drives, the roads are good, and the paths well kept. The hotel is excellently kept, and above all the drainage and cleanliness of the house and grounds are perfect. The offal and excreta are carried in underground pipes to the stream at a considerable distance from the house, so that no effluvia exist in the hotel. During the summer of 1878 but two cases of zymotic disease occurred, which even by any supposition could be attributed to local influence. These were both mild cases of diphtheria in children, the first was brought from a distant city, and developed immediately after arrival, the second was produced by personal contact with the first, whose condition was carefully concealed by the parents for several days after the first symptoms occurred. I am, therefore, strongly of the opinion that neither of them can be justly attributed to local poison. As soon as detected these cases were isolated in cottages, and recovered without any severe symptoms, or any after effects.

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#### ARTICLE XXI.

A REPORT OF AN OPERATION FOR THE REMOVAL OF A SUBPERITONEAL UTERINE FIBROID TUMOUR BY GASTROTOMY. RECOVERY. By J. B. DAVISON, M. D., of Moline, Illinois.

ON the 17th day of February, 1878, I was called to see Miss S.; white; born in Ohio; aged 26; in stature below the average. She complained of pain in the bowels, of constipation and bloating. She presented the appearance of a woman at seven and a half months' pregnancy. She noticed

this tendency to bloating, as she termed it, eighteen months since; it increased gradually and slowly until within three months, since which time the growth has been rapid.

I soon became satisfied that a large tumour existed; supposed it ovarian, and told her and her friends that such was the case, and that, in my opinion, it was useless to pursue any course of treatment other than to remove it by an operation.

I communicated these facts to Dr. C. Truesdale, of Rock Island, and requested him to join me in the treatment of the case, should she determine to submit to the operation, which he kindly did.

Finally, she informed me that she had concluded to have the operation performed, and Tuesday, April 9, was set as the time. Accordingly, we met at her residence on that day, at 11.30 A. M., together with Dr. C. C. Carter, of Rock Island, and Drs. J. W. Morey and C. Piper, of Moline.

The patient was placed upon a table, and chloroform administered. We had a steam atomizer, by which the air of the room was charged with spray before commencing the operation, and the spray was kept up continuously until all the dressings were applied, and the patient in readiness for bed. The spray was from a solution of carbolic acid  $\mathfrak{z}\text{ij}$ , in  $\mathfrak{z}\text{xv}$  of distilled water, and alcohol  $\mathfrak{z}\text{j}$ .

The patient being fully under the influence of chloroform, an incision of about five inches in length was made at the linea alba, between the umbilicus and pubes. On reaching the peritoneum it was found to be somewhat thickened, and between it and the tumour there was a net-like bundle of bloodvessels of considerable size. These pushed aside as best we could, the tumour was exposed. Believing that any adhesions which might be present would be easily broken up, the incision was extended up to near the umbilicus. A broad band was now discovered on the left side, high up on the tumour, which bound the tumour, though not closely, to the abdominal wall. In this band were many large bloodvessels, the whole of which were included in a ligature of silver wire, firmly applied. The ends of the wire were cut off close, and the band divided. A trocar was then plunged into the tumour; there was no discharge; the tumour was solid. Numerous points of adhesion were found and broken up; but it was impossible to remove the tumour through so small an opening. The incision was continued to the left of the umbilicus, and up two inches and a half above it, making, comparatively, an enormous incision; but even then it was with very great difficulty we succeeded in lifting the tumour out. The pedicle, which was two and a half to three inches in length, and three-quarters of an inch in diameter, was now secured by a strong silk ligature, and severed. It was found to be attached, or to have its origin, in the centre of the fundus uteri.

The surface of the tumour was smooth, and of a light-flesh colour; it was, internally, composed of a white fibrous substance, which was uniform throughout its diameter; its weight thirteen pounds.

We had a large-sized silver male catheter, cut off at the commencement of the curve, which we designed using as a drainage-tube. We had also a piece of rubber, one-third of an inch in thickness, one and a half in width, and two and a half in length, at about the centre of which the catheter was passed through. The tumour having been removed, this catheter was passed through the vagina, and thence into the cul-de-sac, which brought the rubber up to the vulva. All blood and serum possible having been removed by warm soft sponges, and oozing having ceased, the ends of the ligature applied to the pedicle were brought into the lower

angle of the incision, and the incision closed by interrupted silver wire sutures, so introduced as to include the peritoneum. Broad strips of adhesive plaster, reaching half round the body, were now applied; then a compress of fine white flannel, wrung out of hot water, was applied at each side of the incision; between these a few strips of patent lint, saturated in a mixture of ol. olivæ, glycerin, and salacylic acid ( $\mathfrak{E}xv$  oil,  $\mathfrak{E}j$  glycerin,  $\mathfrak{Z}ss$  acid). Over this was laid another compress of flannel, wrung out of hot water; over these a flannel binder; and over all a "London" abdominal supporter; the latter only to supply points of attachment for perineal bands, used to maintain a permanent position to the piece of rubber which held the drainage-tube in place, which purpose it served admirably.

The dressing completed, the patient was put to bed. She was somewhat pale, and expressed herself as sensible of a slight aching of the back, but highly gratified with the result. She now took gr.  $\frac{1}{4}$  morph. sulph., and we left her in a very comfortable condition.

*April 9, 8 P. M.*—Pulse 96; temperature  $99^{\circ}$ . A few spoonfuls of nourishment taken, and rejected by the stomach. Morph. sulph.  $\frac{1}{8}$  gr. every two or three hours.

*10th, A. M.*—Pulse 95; temp.  $99\frac{1}{2}^{\circ}$ . Rested well during the night; feels hopeful. Introduced catheter; drew off  $\mathfrak{E}v$  rather high-coloured urine. Continue morphia.

*P. M.*—Pulse 96; temp.  $99\frac{1}{2}^{\circ}$ . Patient has taken food, and is comfortable.

*11th, P. M.*—Pulse 104; temp.  $100\frac{1}{2}^{\circ}$ . No pain nor soreness; skin moist and warm; bloody serum discharging from drainage-tube freely.

*14th, P. M.*—Pulse 100; temp.  $99\frac{3}{4}^{\circ}$ . Patient comfortable; removed drainage-tube.

*17th.*—Dr. C. Truesdale visited the patient with me to-day. Dressings were removed for the first time since the operation. Adhesion has occurred throughout the whole extent of the incision. Sutures removed, except one at the lower angle; dressing applied as before, even the supporter, which the patient believed promoted her comfort.

*20th.*—Pulse 92; temp.  $98\frac{1}{2}^{\circ}$ . Patient feels tired, and a little tenderness in right iliac region. Changed the dressing, and removed the remaining suture.

*25th.*—Pulse 106; temp.  $98\frac{1}{2}^{\circ}$ . Patient complains of a sense of soreness near the umbilicus; at that point an abscess was forming. A small abscess has discharged. At this point the parts had not been intimately brought together, and hence the pus accumulated; but being freely discharged, cleansed, and dressed, it gave no further trouble.

*May 3.*—Pulse 88; temp.  $98\frac{1}{2}^{\circ}$ . Patient sitting up. Removed ligature from pedicle.

*6th.*—Patient passed through urethra a mass resembling fibrin, loaded with sand. Its passage caused agony for the time being, but, soon after, the patient was again comfortable. The sandy matter consisted of the triple phosphates, and the mass in which the sand was rolled up was probably a blood clot.

*15th.*—Patient has walked out a little to-day, and is in her usual health, except that the urine is alkaline, and crystals of the triple phosphates abound, keeping up irritation about the bladder and urethra.

She subsequently took nitric acid and phosphoric acid alternately, with quinia and iron, and at this writing her health is excellent, and her recovery perfect.

## REVIEWS.

ART. XXII.—*Études Expérimentales et Cliniques sur les Traumatismes Cérébraux.* Par le Dr. H. DURET. Tome I., 8vo., pp. 327, XIX planches. Paris: Le Progrès Médical and A. Delahaye, 1878.  
*Experimental and Clinical Studies upon Cerebral Traumatisms.* By Dr. H. DURET.

THE importance of the brain as an intellectual and vital centre, the obscurity and complexity of its lesions, and the difficulties and uncertainties of their treatment have made, and always will make, it an object of the greatest (we had almost said melancholy) interest to both physicians and surgeons, and this interest has been much quickened of late by the recent advances made in our knowledge of the special functions pertaining to different portions of the cerebral hemispheres, and by the success obtained by two French surgeons in cases of operative interference based upon this knowledge. The uncertainty concerning the exact seat of the lesion, especially when the original traumatism had not caused a recognizable fracture, and the symptoms had supervened tardily, made surgeons loath to interfere lest they should needlessly compromise their art and themselves, and the habit of hesitation thus induced led them, illogically, perhaps, but not unnaturally, to extend expectant treatment to other cases also in which more active measures were plainly called for, and even the point for the application of the trephine clearly indicated. When at last the urgency of the symptoms became so great that the surgeon was in a measure forced to operate, the condition of the patient had been rendered so grave by the inflammatory and destructive processes that had been allowed to develop, as to almost preclude recovery, and thus was established a vicious circle—delay in interference leading to fatal results, and the sequence of fatal results justifying or at least favouring delay—which has made trephining a rare operation, and reduced the surgeon almost to the position of a simple spectator in cases of injury to the skull. In some hospitals it is considered almost an axiom that the application of the trephine will be followed by the death of the patient, and in the recent discussions in the Académie de Médecine and the Société de Chirurgie upon the therapeutical uses to be made of the newly-acquired knowledge of motor centres, the great danger of this operation was the argument most strongly urged against interference when the interior of the cranium was not already exposed to the air.

It seems not unlikely that this fear of the trephine is a mischievous tradition handed down from generation to generation and as ill-founded as that of the intolerance of the urinary bladder so recently overthrown by Prof. Bigelow. Even if it is not so, antiseptic surgery has reduced, if it has not entirely removed, the danger, and the only thing that is now required to justify the habitual substitution of active interference for the present policy of expectation or resignation is greater certainty in the means of diagnosis.

For this reason we welcome any work that adds to our knowledge of the

nature and the means of diagnosis of cerebral lesions; and it is to this task that the author of the book now before us has addressed himself. The present volume deals only with the experimental study of cerebral traumatism, the clinical aspects will be considered in the 2d part, which is yet to appear. In this volume we have an analytical study of the pathology and symptomatology of primary lesions, of cerebral commotion, compression, and contusion, and we are promised in the second the syncretical application of the results here acquired to the clinical aspects of these lesions as they are encountered by the surgeon. The scope of this part is indicated by some of the titles of its chapters: cerebro-spinal shock, the influence of an excess of pressure, the mechanism of compression, and the part taken by the dura mater, the meningeal vessels, and the different portions of the encephalon in cerebral traumatisms. The most original, and in some respects the most important, part is that relating to the subject first mentioned, and nearly half the volume is given to its consideration.

*Cerebro-spinal shock* (choc cephalo-rachidien) is the term employed by M. Duret to indicate the sudden arrest or suppression of the functional activity of the brain produced by a blow upon the skull or by an injection into its cavity, when the force is transmitted through and by the cerebro-spinal liquid to certain more or less distant regions of the encephalon, notably the 4th ventricle, and there exerts a vulnerant action. The nature of the shock, the mode in which the action is exerted, and the lesions which it produces were, he claims, discovered by him and first described in the book before us. To the exposition of its nature, cause, and effects, he brings an enthusiasm which is fully justified by the importance of the discovery, and if we feel some hesitation in accepting his analysis of mechanical problems whose very factors are often hypothetical and always complex, we must admit that the opinions of a conscientious worker thoroughly imbued with the scientific spirit, as M. Duret unquestionably is, and applying the test of experiment whenever possible, are not to be lightly questioned by the critic who can give perhaps only minutes or hours to the consideration of questions that have occupied the author for days or weeks. And yet when we remember that even simple problems in physics are beset with difficulties arising from failure to apprehend or rightly estimate the mutual relations of the parts, we may well doubt whether any one is qualified to deal with those presented by the infinite complexity of the skull and its contents. But while we cannot follow M. Duret through all his elaborate and painstaking explanations of the mechanism by which certain effects are produced, we can accept heartily his demonstration of those effects and of their relation to well-known clinical symptoms, and instead of losing by the elimination may even gain by increase of sharpness of outline and precision of conception. We can only gain by fixing our attention upon experimentally-ascertained facts to the exclusion of inferential explanations of them, and by declining to follow the author into hypothetical vacuums produced by questionable *cônes de soulèvement*.

Two facts, two lesions stand out prominently in the record of the experiments; with one of them we are all in a measure familiar, with the discovery of the other and of the agency of the cerebro-spinal liquid in producing both M. Duret is to be credited. But we cannot do better than follow the author's own dramatic method and begin with "*How I discovered the cerebro-spinal shock.*"

He was seeking for the causes and the mode of production of concussion of the brain (*commotion cérébrale*), and had succeeded several times in producing its clinical symptoms by rapidly and forcibly injecting non-absorbable liquids into the anterior of the skull, but in these and even in other cases where the injection of from ten to twenty grammes of water had killed dogs instantaneously, he had found no lesion sufficient to account for the result. The tetanic contraction of all the muscles, the arrest of respiration, and the slowing of the heart's action made him suspect a lesion of the medulla, and with the hope of making this lesion extensive enough to be recognized, he determined to inject a much larger quantity of water than he had previously employed in the experiments. 100 grammes (3 3 +) were injected rapidly by means of a syringe screwed into a small hole made near the centre of the right side of the skull. At the autopsy an extensive rent was found in the median line of the floor of the 4th ventricle, a rent evidently produced by a force acting from within outwards, and the aqueduct of Sylvius and the central canal of the cord were largely dilated.

When we recall the definite plan of the experiment, and note that the dog thus sacrificed was "no. 32 bis," the exultation which M. Duret manifests in the next paragraph seems quite as justifiable as that which sent Archimedes, naked, through the streets of Syracuse, and gave all languages a common cry of triumph. The mode in which the lesion had been produced was apparent: the pressure upon the surface of the hemispheres had forced the cerebro-spinal liquid contained within the lateral ventricles out through the only channel open to it, the aqueduct of Sylvius, into the 4th ventricle, and the latter, not being able to discharge the liquid through the minute foramen of Magendie and the central canal of the spinal cord as rapidly as it was received, was subjected to a dilating pressure sufficient to rupture its walls. In order to eliminate a possible source of error, the direct passage of the injected liquid into the ventricle, the syringe was filled with a thick solution of gelatine instead of water, and the experiment was repeated. The result was the same: muscular rigidity, arrest of respiration, death; and at the autopsy the coagulated gelatine was found solely between the dura mater and the bone. There was a small amount of blood in the cavity of the arachnoid at the base of the brain, the aqueduct of Sylvius was enormously dilated and torn, the central canal of the cord was dilated throughout its entire length, and the floor of the 4th ventricle and the restiform bodies were covered with hemorrhagic spots.

It is too evident to escape the notice of any one that an experiment of this kind, however interesting and valuable it may be from some points of view, cannot be considered an experimental reproduction of any traumatism inflicted upon the skull. The amount of the injected liquid was so great that the compression exerted by it was far beyond that which could be produced by any blow unaccompanied by a crushing fracture. It could serve only to show the manner in which and the point at which a certain much less severe effect might be produced. Granted that the sudden passage of the contents of the lateral ventricles into the fourth ventricle may cause rupture of the latter, it remains to be shown whether a blow upon the skull can cause this passage, and, if it can, by what means; and here we must reverse the Cartesian order followed in this instance by M. Duret, and show what the blow actually does before we try to show what it ought to do, and how it ought to do it. It is not difficult to find material for our

purpose; the book is filled with records of experiments, and we take one, almost at random, from page 47. The dog, a long-haired, blind-man's dog, which had already served for one experiment, but whose health was completely re-established, as the meticulous chronicle informs us, received upon the forehead a blow delivered with violence enough, it was hoped, to kill it. The hope was not ill-founded; the animal remained comatose for thirty-six hours and then died. As the case is also a striking example of the general phenomena ascribed by the author to cerebro-spinal shock, a brief account of the symptoms may serve to show what he includes under that term. Before the experiment the dog's pulse was 100, respiration 24, and rectal temperature  $38.8^{\circ}$  centigrade. The blow, which was given at 9 A. M., was followed instantly by complete loss of consciousness, rigidity of the muscles, flow of blood from the nostrils, and involuntary defecation. During the first two minutes there were but three respirations and thirty pulsations. During the 4th minute four deep, difficult, stertorous respirations; pulse slow (12) and full; slight agitation of the limbs and tail; the respiration grew more rapid until the 8th minute, after which it remained at 32 until about the 25th minute when it was observed to have quickened to 42 with occasional arrests lasting for from 15 to 30 seconds. The pulse was 70, full and strong, each inspiration being marked by from two to four beats more feeble and rapid than the others. The thermometer placed in the rectum marked at the 6th minute  $39.8^{\circ}$ , at the 12th  $39.2^{\circ}$ , at the 25th  $38.6^{\circ}$ , and at the 60th  $37.6^{\circ}$ . The rigidity of the limbs, interrupted by occasional twitchings, especially of the muscles supplied by the facial nerve, gradually diminished and gave place to complete resolution during the second quarter of an hour. The respiration continued difficult and stertorous during the day, varying between 16 and 24; the pulse (including the rapid beats during each inspiration) was 80-90. The temperature at 5 P. M. was  $34.2^{\circ}$ . The next morning the animal was still unconscious; respiration 32, stertorous, pulse 90-100; temperature  $38.8^{\circ}$ . Resolution, pupils punctiform, sensibility obtuse, but reflex sensibility preserved. He remained in this condition during the day and was found dead the next morning. The autopsy disclosed a fracture on each side beginning above the orbital arch, extending through it to the temporal fossa, and ending on the left side in the centre of that fossa, but curving inwards on the right towards the sella turcica. On the left was a small lenticular clot between the dura mater and the bone; the cavity of the arachnoid over the convexity of the right hemisphere contained a layer of blood not more than 1 millimetre in thickness. Both hemispheres were greatly congested throughout, "evidently the first stage of a generalized encephalitis following concussion." Ecchymoses in the sulci between the convolutions, and under the pia mater on each sphenoidal lobe. The ventricles were filled with reddish serum; there were five or six small hemorrhagic spots in the upper third of the floor of the fourth ventricle, the medulla oblongata was greatly congested and softened, and its surface of section showed minute hemorrhagic spots each surrounded by a zone of softening. The central canal of the cervical portion of the spinal cord was dilated with softening and punctiform hemorrhages in the gray substance of its walls.

We must distinguish between the early and late lesions, those which are the immediate consequence of the blow, and those which are due to the subsequent inflammation. Among the first are the extravasations of blood on the surface and in the bulb; it is plain that the latter organ was affected

by the shock although the blow fell upon the forehead; and the dilatation of the central canal, corresponding to that observed in the first experiment mentioned, may be taken as a proof that in this case also the contents of the lateral ventricles were driven violently into the fourth ventricle, and were one at least of the causes of the extravasations found at the upper portion of its floor. Repetitions of the experiment, with blows of different force, and falling upon different regions of the skull, were made by M. Duret with objects and results which we must here pass by without description, but from which we may draw one inference not drawn by him. The rupture of vessels on the outside of the bulb, and the greater facility with which the characteristic lesions of the fourth ventricle were produced when the blow fell upon the forehead or even the occiput than when it fell upon the side of the head, would indicate some other mechanism than simple compression of the hemispheres forcing out the contents of the ventricles. A portion of this objection has not escaped his notice, and he seeks to explain the less effect of blows in the transverse axis by the action of a *cône de soulèvement*, an elevation of the skull produced by its elasticity at the point immediately opposite that at which the blow was received, and corresponding to the *cône de dépression* at that point. He thinks that the sort of vacuum thus formed solicits the liquid contained in the subarachnoid space and thus diminishes the effect of the *cône de dépression*. When a blow is delivered upon the vertex no *cône de soulèvement* can be formed because the opposite point rests upon the spine and cannot yield. It may be that all this is true, but there is nothing in the book to prove it, and it is not easy to believe without a demonstration that the elasticity of a globular body is manifested only in a change of form at the point opposite that at which the original impulse is received. As for the blow upon the vertex, the assumed absence of the cone of elevation can hardly be accounted for by the reason given, for if it could not be produced by its own actual projection, it could by a relative projection, that is by the rebound of the rest of the skull, or, as any one who has squeezed an orange or a rubber ball must have observed, its absence would be compensated for by the increase of all the transverse diameters. It seems a simpler and more probable explanation, if we may hazard one, to infer that a more complete or uniform compression is produced by a blow upon the forehead, since it acts directly upon both sides, and that its effect is increased by the fact that the movement of the wave being in the axis of the blow it is augmented by the direct application to it of the force.

It is frequently noted in the autopsies that clots of considerable size were found on the outer surface of the medulla oblongata, and M. Duret explains these, as he does all others on the surface, by the action of the peripheral wave,<sup>1</sup> that occupying the subarachnoid space. This wave, he thinks, distends the meshes of the space and thereby ruptures the vessels, just as a hypodermic injection sometimes ruptures those of the subcutaneous cellular tissue. That this action is exerted by the wave is proved beyond a question by some of his experiments, but it seems as if the generalization had been carried a trifle too far, and that the author's legitimate pride in the force discovered by him had led him to overlook a not unimportant adjuvant. The disparity between the extent of the peri-bulbar lesions and others

<sup>1</sup> We use the term *wave* merely as a convenient one for expressing the movement of the liquid from one point to another; it must be remembered that the movement, in the subarachnoid space at least, takes place through a multitude of small channels, and is therefore a collection of streams rather than a single wave.



likewise produced at a certain distance from the point receiving the blow leads one to look at once for a special reason. No such reason is presented by the sub-arachnoid space, its meshes are no larger, its capacity for distension even less than elsewhere, there is no reason to think that the liquid has a special tendency to collect there, on the contrary the distensibility of the neighbouring occipito-atlantoid ligament seems to furnish a sort of local safety-valve. What then can be the reason? The attention that is not pre-occupied falls at once upon the gross anatomical differences, the stalk-like form of the medulla, its position in the axis of the blow and at the very outlet of the skull—all point to a reason less recondite than that contained in the waves of the cerebro-spinal liquid. The medulla oblongata seems to be so exposed to the receipt of direct violence that it might almost be used as an argument against the doctrine of the survival of the fittest. It must be noticed too that the extravasations are found upon its anterior surface, there where it rests upon the basilar process at the very point where the impulse of the direct force transmitted through the bones would be received.

But these are only objections of detail; they leave this main fact that lesions are produced by peripheral and ventricular waves of the cerebro-spinal liquid unshaken. We have yet to consider the manner in which the waves are produced and propagated. The first of the essential elements in this consideration is the elasticity of the skull. We use the term elasticity advisedly, for the results in all the experiments were obtained without the aid of depressed fractures. The elasticity of the skull scarcely needs a demonstration. Almost every one knows that an empty skull let fall upon the pavement rebounds to the hand that dropped it; but the measure of the elasticity, the extent to which it yields, and therefore the measure of the compression which the blow exerts, is not so well understood. A single experiment puts it in a very clear light. Félizet (p. 28) filled a skull with melted paraffine, cooled it, and let it fall from a height of  $2\frac{1}{2}$  feet. The globe of paraffine was then removed and showed at the point corresponding to that which received the blow a flat circular surface more than an inch in diameter, and representing a depression of one-third of an inch, or in cubic measure .13 of a cubic inch, a very considerable amount for so moderate a blow. To understand its effects upon the contents of the skull we must turn to M. Duret's description of the disposition of the cerebro-spinal liquid.

The cerebro-spinal liquid is collected in two irregular masses, the peripheral and the ventricular, communicating with each other by a narrow opening at the lower end of the fourth ventricle, the foramen of Magendie. The arrangement of the ventricular portion is comparatively simple; it is contained within the ventricles and the central canal of the cord, and its different portions communicate quite freely with one another. In order to understand the action of this portion in producing the lesions of cerebro-spinal shock we must bear in mind the fact that the great part of it occupies the lateral and third ventricles, and communicates with the smaller part in the fourth ventricle through the aqueduct of Sylvius or *iter e tertio ad quartum ventriculum*.

The disposition of the peripheral portion is much more complex; it occupies the subarachnoid space covering the brain and cord, a space which, beginning in or continuous with the so-called lymphatic sheaths of the fine arterioles distributed to the substance of the brain, the *gaines de Robin*, expands into larger channels in the sulci between the convolutions,

and finally into sacs of different sizes at the sides and base of the brain. It is continuous also with the sheaths of the vessels and nerves of the organs of special sense. This arrangement is happily compared by M. Duret to a system of brooks, rivers, and lakes, the principal rivers being the channels in the fissures of Sylvius and Rolando, and the lakes the *sylvian* at the lower extremity of the fissure of Sylvius, the *central* at the base of the brain, the *inferior cerebellar* behind and below the cerebellum, and the *terminal* at the lower end of the spinal cord. The communication with the ventricular portion is through the foramen of Magendie, between the inferior cerebellar lake and the fourth ventricle.

The liquid is produced by exudation from the vessels, and its tension is greater than that of the air, being equal, according to Leyden, to that of a column of water 10 centimetres high, and rising during violent respiration to 14 or 15 centimetres. Of the many interesting points connected with the functions of this liquid we have space to mention only one, namely, the manner in which it protects the brain from injury by changes in the amount of blood supplied to it. It is apparent that as the cavity of the cranium is always completely filled, and its walls are not distensible, the brain would be compressed at each beat of the heart by the additional amount of blood forced into it, unless provision were made for a simultaneous withdrawal of a portion of the contents of the cranium. This provision is found in the veins and in the distensibility of a portion of the walls of the spinal canal. The cerebro-spinal liquid receives the impulse of the pulsation, gives way before the dilating arteries, presses upon and compresses the veins, and distends the membranous portions of the spinal canal. This can be clearly demonstrated by the graphic method at either end of the canal. If the occipito-atlantoid membrane is exposed by division of the muscles of the back of the neck, traces can be obtained showing the effect upon it of every pulsation and respiration.

As the sub-arachnoid space is not an empty sac like the cavity of the arachnoid, but is generally occupied by a delicate fibrous reticulum supporting the bloodvessels, in the meshes or intervals of which the liquid is contained, every sudden or extreme dilatation is attended by the risk of rupture of the filaments and vessels, and of consequent extravasation of blood. The same effect is produced, although by a different mechanism, in the minute prolongations of the cavity along the arterioles; when the peri-vascular sheaths are distended by the afflux of the liquid under the impulse communicated by a blow, the arterioles are compressed directly by the liquid, and the capillaries indirectly by pressure through the brain substance; then if the pressure is suddenly released the vessels burst by the unopposed tension of their contents. This has no special pathological significance, but it was very prettily shown by an experiment devised with this object. Pressure was gradually made upon the brain by an injection of wax, and maintained until the death of the animal; very few and slight hemorrhagic lesions were found. The experiment was then repeated, and when the same degree of pressure had been obtained it was suddenly diminished; the tissue of the brain was then found to be filled with small hemorrhagic foci.

The effect of this pressure upon the respiration, and the dependence of the respiratory phenomena upon the cerebro-spinal liquid, are clearly shown by the experiment recorded on page 79. After section of the muscle of the back of the neck, and exposure of the occipito-atlantoid membrane, an injection of 15-20 grammes of wax was made rapidly through an

opening in the anterior portion of the vertex. This was followed immediately by very violent opisthotonos and total arrest of respiration. After the animal had remained a minute and a half in this condition the bulging distended occipito-atlantoid membrane was punctured with a small triangular needle, and the liquid allowed to flow out; the animal immediately began to breathe again at the rate of sixteen respirations per minute. Two or three minutes later the respiration again ceased, and it was observed that the liquid was no longer flowing, and that the membrane was again bulging; a second puncture was followed by a second renewal of respiration; then, after three or four minutes a third arrest, third puncture, and permanent re-establishment of the breathing.

As the cerebro-spinal liquid is distributed so widely it is easy to understand that blows acting upon and through it should produce lesions at every part of the brain, although their severity at the different points would vary according to the facility with which the liquid could pass from one part of the sub-arachnoid space to another. While it is true that, in accordance with the well-known hydrostatic law, pressure upon an inclosed body of water will be felt equally at every point on the inclosing surface, the character and size of the channels of communications between the different parts of that space, if its walls are at all distensible, will modify the effects of that pressure by affecting the facility with which the liquid passes from one part to another.

This fact, while referred to indefinitely by M. Duret at one or two places in his book, does not receive from him the attention which it deserves, for by it alone can, among other things, the bursting pressure exerted within the fourth ventricle be explained. As that cavity communicates, through the foramen of Magendie, with the neighbouring sub-arachnoid space, the pressure within and without the ventricle when the liquid is at rest is the same, and the only effect of increase of that pressure would be increased compression of the bulb between the two bodies of liquid, as a piece of iron is compressed between the hammer and the anvil. But, as the communication through the foramen is insufficient to accommodate a wave of liquid (as shown by the rupture of its walls), and as similar obstacles prevent the timely arrival at the posterior cerebellar lake of the peripheral wave originating at the cone of depression, the unbalanced pressure within the ventricle produces rupture of its wall, just as a rubber ball is burst by a too vigorous attempt to force its contents through a small orifice. The distensibility of portions of the wall of the spinal canal affords a space into which the liquid contents of the cranium can pass, and the conditions of the problem, therefore, are not those of simple pressure, but the much more complex ones of liquids in motion; and although the effects of variation in pressure are shown in some of the lesions, the most important ones are those produced by the waves.

The lesions found on the convexity of the hemispheres are hemorrhages of greater or less extent from the vessels of the meninges, and, when the bone has been broken, of direct laceration. M. Duret thinks that when the bone has not been broken, the lesions found under the point where the blow was received are the result not of direct violence, but of the sudden springing back of the corresponding portion of bone after it has been depressed; into the vacuum thus formed the return wave rushes, and tears up the meningeal vessels. He rejects also the old explanation by contrecoup of the lesions at the opposite side of the skull, and substitutes one similar to that just mentioned, the vacuum being formed by an elevation

of the bone corresponding to the depression produced at the opposite point by the blow (*cône de soulèvement*). We have already remarked that there is no proof of the existence of such an elevation, and, therefore, the argument based upon it cannot be accepted. The hemorrhages are in the form of ecchymoses under the pia mater, staining of the liquid in the sulci by rupture of the small vessels in the arachnoid meshes, and in small miliary foci due to rupture of the capillaries by changes of pressure in the lymphatic sheaths.

At the base of the brain the lesions are frequent and extensive, consisting of hemorrhages into the central and sylvian lakes, and sometimes, by rupture of its visceral layer, into the cavity of the arachnoid. Similar lesions are sometimes found around the bulb, and to a greater or less distance down the spinal cord.

The lesions within the fourth ventricle have already been described in part; they comprise extravasations of blood of greater or less size, most frequent at the lower angle, and next at the upper angle of the ventricle. These are sometimes extensive enough to give rise to the formation of a distinct clot, but most commonly are only miliary foci. It is worthy of note that a V-shaped mass of gray matter lying near the lower angle, and thought to be the origin of the pneumo-gastric nerve was frequently occupied by some of these foci. The foramen of Magendie is frequently torn, and in very severe cases the floor of the ventricle may be split. Interstitial hemorrhages are often found in the substance of the medulla and pons.

Finally, hemorrhagic lesions are sometimes produced at different points in the spinal cord. The case reported on page 102 is an interesting example of traumatic locomotor ataxy caused by a blow on the side of the head, the lesion consisting of an extravasation under the pia mater covering the posterior columns of the cord at the brachial enlargement.

The *symptoms* produced by cerebro-spinal shock are manifested in the muscles, respiration, circulation, and intelligence. The shock is followed instantly by an intense spasm and rigidity of the muscles, a spasm which is so general that it must be looked upon as reflex, as a manifestation of an irritation of sensitive centres, of the restiform bodies, according to M. Duret. This rigidity disappears in the course of a few minutes, and is followed, according to the severity of the shock, either by a return to the normal condition, or by complete resolution lasting until death. Agitation or paralysis of different groups of muscles is an indication of local lesions to be referred to hereafter.

With this spasm of the muscles of relation is associated a similar condition of the muscles of organic life, notably those of the arteries. These vessels contract, the tension of the blood contained in them is increased, and as a consequence of the obstruction which this offers to the passage of the blood through them, the tension in the veins is greatly diminished. In an experiment upon a horse the tension in the jugular vein sank from 16 centimetres to 4 at the moment of the shock, an enormous difference, which plainly shows how complete the anæmia of the brain must have been. This spasm is followed by a general dilatation of the vessels, the result either of fatigue or of inflammatory action set up by the numerous hemorrhagic lesions. The effect of these variations in the blood supply is seen in the functional disturbances of the brain; the primary anæmia causes complete loss of consciousness, which is prolonged by the succeeding hyperæmia, and may last, if a generalized inflammatory process is set up, until death.

We cannot follow the author through his examination of the many interesting consequences and incidents of this spasm, but will mention only the changes produced in the temperature which are ascribed by him to it. Starting with the theory of the profound antagonism between the vessels of the peripheral and of the visceral circulation, as established by the researches of Claude Bernard and other physiologists, he claims that, while there is arterial contraction in the brain and on the surface, there is arterial and capillary dilatation in the abdominal viscera, and this dilatation is marked by local rise of temperature. The facts are that the rectal temperature rises to  $39.5^{\circ}$  or  $40^{\circ}$  centigrade immediately after the shock, or even to  $41^{\circ}$  or  $42^{\circ}$  in very severe cases. It subsides promptly, falls below the normal, and remains there until death or the beginning of the inflammatory stage. This theory of visceral dilatation does not harmonize however with the preceding theory of generalized spasm; and as we know that muscular action will raise the temperature of the body, and paralysis will lower it, it seems more reasonable to ascribe the rise of temperature to the intense action of the muscles, and its fall to the subsequent resolution which amounts practically to paralysis.

The contractions of the heart are at first precipitate, feeble, and incomplete, and soon become natural if the blow has been light. But if the blow is violent the pulse becomes slow, strong, and tense; this corresponds to the period of contraction of the arteries. If the blow is still more violent the period is marked by a dirotism during the inspiratory acts that may be mistaken for rapid and feeble pulsations. When dilatation succeeds the contraction of the arteries the pulse remains slow, but is soft instead of tense; and, if finally the inflammatory stage is reached, the pulse becomes rapid.

The changes in respiration present five stages. The 1st is that of spasmodic arrest, and is common to both slight and severe shocks. It lasts only two or three minutes, and is followed by the stage of primitive acceleration which lasts fifteen or twenty minutes, and is the result of direct irritation of the respiratory centres. The 3d stage, that of irregularity and intermittence, is found only after severe shocks, and is due to lesion of the pneumogastric nerve itself, or of its origin in the gray matter at the lower angle of the fourth ventricle. The 4th stage, that of slowing, is marked by fulness and slowness of inspiration, followed without any interval by short expiration. The 5th stage is that of secondary inflammatory acceleration. Stertor is common in the severe cases, and is ascribed to traumatic paralysis of the muscles of the soft palate. In some of the recorded experiments it appears, however, to have been only an incident of the general muscular resolution; and in two, pages 109 and 130, it existed only during short periods of insensibility.

Two experiments were made with the view to determine the points in the 4th ventricle, irritation of which would excite spasms of certain muscles, such as had been observed in some cases, especially those of the eyes, lips, and jaws. The results with reference to these points were in the main confirmatory of those obtained by other physiologists, but incidentally others were obtained which strikingly corroborate the author's explanation of the relations between the lesions and symptoms observed in the other experiments. The occipito-atlantoid membrane of a dog was exposed, a director passed upwards through it, and its point pressed against different parts of the floor of the ventricle. Not only was the expected action of the different muscles excited, but general rigidity, opisthotonos, arrest of respira-

tion, unconsciousness, and loss of reflex sensibility were also produced. These experiments may be considered a positive proof of the causative relation existing between the lesions and symptoms observed in the other cases, and the previous experiments are an equally positive proof of the agency of the cerebro-spinal liquid in the production of the lesions in these other cases. The experiments of M. Duret have made it necessary for us to revise our opinions upon many cerebral traumatisms, and he deserves great credit for having discovered and demonstrated a factor in their production which has hitherto been overlooked.

The capital point in this discovery is the fact of the passage of the contents of the lateral ventricles into the fourth ventricle under the influence of pressure exerted upon the hemispheres, and this fact is to be taken into account in apoplexies as well as in traumatisms, for, as is shown in another part of the book, the injection of a small amount, 3 to 5 grammes, of a non-absorbable liquid into the substance of the brain or upon its surface is sufficient to produce the symptoms and lesions of cerebro-spinal shock; and an analysis of the symptoms of apoplexy shows a remarkable similarity, if not an absolute identity, with those above described. There is the same loss of consciousness, and its explanation by vascular spasm followed by dilatation is supported by post-mortem evidence. There is also the short convulsive stage (irritation of the sensitive tracts of the bulb), followed by complete resolution, with loss of both absolute and reflex sensibility. The pulse shows the same changes, at first slow and filiform, then natural but weak, then accelerated; and the analogy between the respiratory phenomena is particularly close. Finally, the temperature is also lowered, and rises again, of course, if the inflammatory stage is reached, and probably would show the short primitive rise corresponding to the spasm of the muscles if the observation could be made. Its short duration, ending perhaps before the arrival of the physician upon the scene, and the necessity of measuring it in the rectum are sufficient reasons for its having hitherto escaped observation. M. Duret claims that the mechanism by which these symptoms are produced is the same in both cases, namely, the sudden passage of the contents of the lateral ventricles into the fourth ventricle and the consequent irritation of the restiform bodies; and he intimates in a footnote that this theory has received the support of Prof. Charcot. The statement, however, certainly needs to be accompanied by a limitation, one which doubtless was not overlooked by him, but is not expressed in set terms. The explanation can be true only of rapid hemorrhage from a vessel of considerable size, for the compression exerted by a slight hemorrhage, or by one occurring slowly, would be insufficient in amount or in rapidity of production to exert the mechanical action essential to this theory. This absence of the lesions and symptoms of cerebro-spinal shock, when the compression is increased slowly and gradually, is plainly shown in the histories of some of the experiments recorded in the chapter devoted to the examination of the mechanism and influence of compression.

It does not seem desirable to enter as fully into the author's examination of the effects of compression of the brain as into that of the cerebro-spinal shock, and we shall therefore confine ourselves in what follows to the more prominent results of this examination, leaving the others to be considered when the second or clinical part of the book shall have appeared.

It follows, of course, from what we have already learned of the cerebro-spinal liquid, that any compression of the brain, any diminution of the

capacity of the cavity of the cranium, exerts an effect at all points occupied by that liquid, an effect dependent upon the degree of increase of its tension. This increased tension diminishes the calibre of the vessels (by pressure upon them) and the amount of blood which passes through them in a given time, and the results of this local anæmia are shown in the disturbance of the functions of the cerebrum and medulla. If the tension of the cerebro-spinal liquid becomes equal to that of the arterial blood, the circulation is arrested and the individual dies. This equality of intra- and extra-vascular tension cannot, however, be produced by an escape of blood into the cavity, unless the vessel ruptured is a very large one; and, moreover, the vascular spasm produced by the irritation of the sensitive nerves or centres increases the arterial tension so much (from 8 centimetres of mercury to 22 or even 28), that an equal extra-vascular pressure is probably produced only in experiments, and never in diseases or traumatism. This increase of tension is marked by notable slowing of the pulse, except when it is great enough to cause death promptly; in this latter case the pulse is accelerated, usually to such a degree that it cannot be counted. The other symptoms, which become more marked as the pressure increases, are somnolence, dulness of intellect, and diminished sensibility or complete coma, according to the pressure. This increase of tension cannot be estimated either clinically or post-mortem, and in its place we have to consider the size of the clot, and decide from that whether the symptoms observed during life were due to compression or to some other pathological influence.

With the view of determining the relations between increased tension and the amount of compression, M. Duret made a number of experiments, consisting in the injection of wax into the arachnoid cavity or between the dura mater and bone, and found that in the latter case a clot equal in size to one-twelfth of the capacity of the cranium would cause coma and death in a few hours, while in the former case the clot produced these results only when it became equal in size to one-sixth or even one-fifth of the capacity of the cranium. In attempting to utilize these facts in clinical observation, however, we must remember that they apply only to *early* symptoms and to cases in which there is no concomitant lesion of the nerve centres; for the cause of the later results is found in the subsequent inflammation and changes in the circulation.

The symptoms produced by pressure exerted by increased tension of the cerebro-spinal liquid may be usefully classified according to their origin in the hemispheres or in the medulla. Those pertaining to the former are muscular weakness and dulness of the intellect and sensibility, varying directly in intensity with the pressure. The medulla and spinal cord being the centres of reflex sensibility, pressure upon them is manifested by dulness or abolition of reflex sensibility, for which touching of the cornea is the best test, because that organ is under the control of the medulla and is the last to lose its sensibility, both because it is near its nerve centre and because the vascular supply of the medulla is such that it resists pressure longer than any other part. This resistance of the medulla to traumatic influences led Charcot, in imitation of Haller, to call it the *ultimum moriens* of the nerve centres, and its possession of this quality is amply justified by the importance of the functions over which it presides—circulation, respiration, and animal heat. As a rule, pressure causes no change in either of these three functions until after the tension of the cerebro-spinal liquid has become nearly equal to that within the arteries; then both pulse

and respiration grow slow, and the temperature of the body falls. If the tension is increased until it equals or exceeds that of the arterial blood, the temperature falls still lower and the respirations grow less frequent; but the pulsations suddenly become so rapid that they cannot be counted, and the animal dies in a few moments. A positive sign of obstruction to the circulation of the medulla is furnished by the character of the respiration (slow and deep inspiration with more rapid expiration) and the occurrence of three or four rapid pulsations during each respiratory act. (M. Duret does not seem to be quite sure of this observation, for he speaks of it in other places as a "dirotism which might be mistaken for rapid pulsations.") The predominance of symptoms referable to the medulla is characteristic of intra-ventricular pressure (extravasations). In contrast to this, pressure upon the anterior surface of the hemispheres, if moderate, quickens the respiration and pulse; if greater, it slows the respiration, and after a longer interval the pulse also.

We need not follow the author in the parallel he draws between the symptoms of cerebro-spinal shock and of compression; for, although interesting, it is necessarily incomplete and must await a fuller development in the clinical portion of the work which is to follow, and we must close our review of this portion with a consideration of the important symptoms produced by lesions of the dura mater. Their importance is due to the fact that this membrane is well supplied with sensitive nerves coming mainly from the fifth pair, the physiological action of which can be easily excited by traumatism of the skull or by inflammatory processes within it. The manifestations of this action complicate the symptoms due directly to the primary lesion and render an accurate diagnosis difficult, because some of them are also symptomatic of lesions of the brain substance. Without entering into any of the details of the experiments, we may give briefly the conclusions arrived at. As the nerves are nerves of sensation, pain is, of course, a frequent symptom, and the others are those of reflex irritation manifested by spasms and contractures in the muscles, by modifications of the respiration and pulse, and by vaso-motor changes in the eyes and brain, with consequent somnolence or coma. The spasms and contractures of the voluntary muscles are situated sometimes upon the same side as the lesion, sometimes upon the opposite side; they have a tendency to become more or less generalized, and involve the neighbouring groups of muscles, and never have the localization and voluntary appearance of contractions induced by lesions of the cortex.

The diagnosis of lesions of the dura mater, their differentiation from those of the brain substance itself, has a positive and practical importance, because they may be due to a depressed fragment of the inner table of the skull or to a clot of blood between the dura and the bone, and therefore amenable to surgical treatment.

If we compare them with the symptoms of the lesions accompanying cerebro-spinal shock, we find that in the latter a slight lesion, *e. g.*, a superficial extravasation, gives rise at first to symptoms indicating exaggerated functional irritability of the corresponding part of the brain, that is, to localized muscular twitchings. If the lesion is more severe, if it is destructive, it causes paralysis; and in both cases, when the lesion involves the cortex, the symptoms appear on the opposite side of the body. Permanent contraction of different muscles appears only secondarily, after the lapse of one or more days. It is at first limited to the muscles corresponding to the injured nerve centre and to the neighbouring groups, but may become generalized and even affect both sides of the body.



The symptoms produced by lesions of the cortex in the primary stage are thus seen to be entirely distinct from those due to lesions of the dura mater; in the former they occupy the side of the body opposite to the lesion; in the latter they occupy the same side: paralysis may occur in the former but not in the latter; in the former, spasmodic muscular action is distinctly localized and has a sort of voluntary character, while in the latter it is generalized and involuntary in appearance.

The permanent contractions of the second stage are attributed by M. Duret to subsequent irritation of the dura mater, and are therefore not to be distinguished from those produced by lesion of the dura alone. There is, however, one variety, and an important one, of muscular contractions excited by injury to the substance in which the dura mater plays no part; the irritation is propagated directly from the seat of the lesion to the medullary centres by the aid of the white motor fibres of the hemispheres. In this case the symptoms are always those of epileptiform attacks beginning usually in the muscles which correspond to the brain centre first affected.

The two remaining chapters of the book are devoted to the part played by the meningeal vessels in cerebral traumatism, and to a résumé of the relations between the lesions of the different parts of the encephalon and particular symptoms, including a few contributions to the study of the localization of motor centres and the propriety of surgical interference based upon them. There is nothing in these chapters that requires especial mention here, and we now leave the book with the conviction that it is well worth study by all, and that as a product of accurate experimentation and cautious inference, it is not only a valuable contribution to the surgery and physiology of the brain, but also gives the assurance that French science will find in the new ranks men not unworthy to take the place of those who have made her past and present illustrious.

L. A. S.

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ART. XXIII.—*A Clinical History of the Medical and Surgical Diseases of Women.* By ROBERT BARNES, M.D., Lond., Censor of the Royal College of Physicians, Obstetric Physician and Lecturer on Obstetrics and Dis. of Women to St. George's Hospital, etc. Second American from the second and revised London edition. 8vo., pp. 784. Philadelphia: Henry C. Lea, 1878.

THE American profession will receive with great pleasure this second edition of Dr. Barnes's excellent book. Dr. Barnes, in his brief visit to the United States in our Centennial year, made many acquaintances, many friends, and they will be glad to have him address them again, even though it be by the printed page, and from the other side of the Atlantic. Moreover the book especially commends itself to American readers by its recognition of American works and workers in gynecology, and by its graceful dedication to one whom the profession of this country hold in such high honor, Dr. Fordyce Barker.

The title page states that this edition is from the second and revised London edition, and Dr. Barnes, in his preface, refers to the revision as having been "conscientious." But the thoroughness of this revision—its

careful minuteness and completeness—will hardly be recognized by any reader who does not collate the two volumes, comparing page with page and sentence with sentence. Such collation will show that hundreds of changes have been made; here new matter introduced, there old eliminated; alterations in order and connection; some old illustrations omitted and many new ones inserted; verbal or other variations of individual sentences, modifying the thought or presenting it in clearer and more condensed form—these are among the characteristics and results of a revision which the author has justly termed conscientious.

Having so recently presented a review of the first edition of this work, our observations at this time will be chiefly occupied with the new matter and with some parts of the old not referred to in that review.

The first chapter is devoted to the anatomy of the external and internal organs of generation. Several new illustrations are introduced, nearly all from Sappey; one is credited to Kundrat, but we believe the name of our St. Louis friend, Dr. Geo. J. Englemann, should also be associated with it. Upon the authority of Sappey, the peritoneal investment of the ovary, which still holds so firm a place in the minds of some, is rejected; we believe, however, that Waldeyer is the authority to be referred to in this connection. So, too, the ovarian tunica albuginea is a thing of the past. Why not also discard the words Fallopian tubes, replacing them by oviducts, as briefer, and because tube is no more the equivalent of *tuba*, a trumpet, than a popular designation of the menstrual flow, *flowers* is of *fluor*.

The *carunculæ myrtiformes* remain the products of the ruptured hymen, though there is excellent authority for the statement that these little bodies are quite independent of the hymen.

*Dyspareunia*, second chapter, p. 72, still holds its place; though we believe we conclusively showed that Sophocles attached no such meaning to the primitive as is given the derivative, and that, therefore, the definition of the word as used by Dr. Barnes is constrained, arbitrary, and not essential. Nevertheless a word is needed to indicate difficult or painful sexual relations, and as Dr. Barnes expresses them by this term, its general adoption is not doubtful. *Dyspareunia*, too, is not lacking in euphony, and that is more than can be said of some other of the author's additions to the English language, such as *dyschezia*!

On page 73 the menstrual fluid is called a secretion, and on the next page we learn that "nearly the whole genital tract secretes mucus." Now is it not a wrong use of language to call the menstrual liquid a secretion? Is it a secretion in the same sense, or in anything like it, that mucus, or any other glandular product, is? The secretion theory of menstruation we were faithfully taught in our student days, but we supposed that such a view was of the past, both dead and buried, and the present use of the term secretion in such connection by Dr. Barnes and other teachers, is rather an accommodation than a strictly correct application; nevertheless it may be misleading.

On page 94 Dr. Barnes refers to Dr. Emmet's extolling hot vaginal injections—one of the most valuable contributions to uterine therapeutics—but neither commends nor condemns the practice.

In considering the *varieties of watery discharges*, p. 86, Dr. Barnes remarks:—

"In one case, which was under my close observation, hydrorrhœa to the extent of a pint or more daily, occurred during the three latter months of gesta-

tion. This certainly came from the cervix. Other cases satisfy me that the cervical glands may secrete large quantities of watery fluid; and there is generally no necessity to seek higher up for the source. This copious secretion finds analogy in the occasional free secretion of water from the stomach, and in the profuse salivation of pregnancy. As I have shown elsewhere, the entire glandular system is rendered more active in pregnancy; and the increased vascular tension of this condition is relieved by discharges, sometimes at one point, sometimes at another. I do not think it is desirable to try active means to control these discharges, which are really of physiological significance. The only true remedy is the termination of gestation, which must be awaited with patience, unless serious constitutional impairment threaten."

On page 88, referring to the same subject, *i. e.*, *watery discharges*, another important statement is made:—

"I have seen profuse watery discharge from the uterus and its neck in cases of retroversion and retroflexion of the uterus. Here we may infer that their glandular structure was unusually active, and that the vascular fulness was increased by the imperfect return of the blood by the veins, compressed or strangled by the malposition or distortion of the uterus. Certain it is that in one very marked case profuse watery discharge ceased with restoration of the uterus to its normal position."

The third chapter is a new one. It is a consideration of the symptoms of vesical and urinary, and of rectal disorders in relation to uterine and peri-uterine affections. Dr. Barnes very truly remarks that in the majority of cases where women complain of vesical disorder, the cause of the distress will be found outside of the bladder.

*Retention of urine* is the first topic discussed; and its symptoms, varieties, causes, diagnosis, and results fully presented. Then follow *ischuria*, *vesical irritability*, *cystitis*, *incontinence of urine*, *dysuria*, *abnormal excretions from the bladder*, and *malignant disease, primary and secondary*, of this organ. Under the head of abnormal excretions from the bladder, of course discharges of blood are considered. We believe an additional cause to those mentioned by Dr. Barnes of such discharge may be given, *viz.*, the opening of a peri-uterine hæmatocele into that organ—but of this again. Six pages of the chapter are occupied with the second subject. Dr. Barnes, in the course of the consideration of it, gives the method of exposing the lower portion of the rectum to view, first devised and practised by Dr. H. R. Storer, but does not mention Dr. Storer's name.

This valuable chapter concludes with this important lesson:—

"One lesson will be drawn from the clinical deductions made in these studies of the relation of the bladder and bowel distress to disease of the neighbouring structures. It will be seen how impossible it is to pretermitt close examination of the surrounding organs without serious risk of overlooking conditions that may be fatal if neglected, and which may be remedied if discovered. Whilst we are looking at the kidneys or the intestine, because they are disturbed in their functions, it may be the uterus or the ovaries that are in fault. We thus see how dangerous it is to practise in the spirit of pure specialism; how absurd it is to map out the body, and assign particular territories to particular classes of practitioners. It will be seen how intimately, how indissolubly that part of medicine which takes for its basis the particular study of the generative system in woman, is linked with the disorders of the alimentary, vascular, and nervous systems; that is, a pure speciality cannot exist. A more monstrous thing cannot be conceived."

The sixth chapter—*Pathology of the Ovaries and Menstruation with its Disorders*—shows several additions. Among these are a presentation

of the arguments against the ovarian theory of menstruation formulated by Dr. Kesteven in 1849, "objections that have been taken up by several German writers," says Dr. Barnes, and answers them satisfactorily or not according to one's belief or disbelief in the aforesaid theory. Believing the theory, the reply is to the reviewer quite conclusive. We cannot see why conception should be a constant power in women and an intermittent one in the animal world, and why she should be exempt from the general law of periodical ovulation holding in that world. We are in full faith with Stoltz, when he asserts that menstruation is the external sign of ovulation, and a consequence of ovarian excitement. Sphygmographic tracings are presented, showing the high tension preceding the menstrual flow, and of that at the end of gestation, and then of the ordinary tension after menstruation. The views of Kundrat and Englemann to the effect that the menstrual hemorrhage is a retrogressive process, under which the superficial layers of the mucous membrane, having undergone fatty degeneration, are being exfoliated, are presented, but by no means endorsed.

In referring to the *menopause*, Dr. Barnes quotes with approval the statement of Dr. Fordyce Barker, that a woman over fifty-five is past the period of child-bearing. Alas! for the collection of late pregnancies which Tilt has given in *Change of Life*. Alas! too, for the credibility of Pliny, who states that Cornelia gave birth to Valerius Saturninus when she was seventy years old; and of that of Renauldin, whom Raciborski cites without contradiction or the slightest indication of skepticism, and who asserted he knew a woman whose menstruation had ceased for ten or twelve years, giving birth to a child when she was sixty-one.

*Vicarious* or *ectopic* menstruation retains its place. Why not substitute for the two words *xenomania*, proposed by Flamant more than fifty years ago, a word quite as expressive as euphonious, and of as pure Greek origin as *copræmia*?

In the conclusion of the chapter Dr. Barnes makes the following important remarks in reference to *masturbation* :—

"In association with this subject we cannot avoid allusion to masturbation. I must express my opinion that this subject has been invested with an atmosphere of gloom and terror very much darker than cool observation warrants. The history of the countless celibates of both [*sic*] sexes will carry a just conviction to the reflective mind. But, making all due allowance, the fact remains that the practice is, in some instances, the result or the cause of the most deplorable nervous disorders. Experience has shown that the attendant disorder is not necessarily dependent upon the condition of the external genital organs. The vice has been practised when the clitoris is small; it has been continued even after the clitoris has been amputated. It is kept up in some cases as in the scratching of pruritus, by local inflammation. I have seen the vulva intensely red, the epithelium abraded, even ulcerated. In extreme cases of erotic mania, and even in cases less severe, I believe—the enthusiastic advocates of non-restraint notwithstanding—that resort to the camisole is dictated by the soundest medical and ethical laws."

In the eighth chapter, *Dysmenorrhœa*, Denman is quoted as having anticipated one of the most commonly accepted theories of dysmenorrhœal membrane.

Dr. Barnes is still a warm advocate for incision in mechanical dysmenorrhœa, and still holds that the obstruction is generally at the external os uteri. In the operation he still believes in scissors, especially in Küchenmeister's, but devotes less space than in the former edition to the argument against metrotomes. He observes that—

"Immediately after the operation, or on the next day, it is generally useful to insert an intra-uterine pessary. I formerly used Wright's. I now prefer my galvanic coil pessary. Its flexibility adapts it more easily to the uterine conditions. It tends to straighten the uterus without injurious rigidity, and it stimulates development. Pregnancy has more frequently followed since I adopted this instrument."

In the next chapter, *Climacteric Disorders*, the author presents this explanation of the occurrence of organic disease at the menopause:—

"To a certain extent the healthily acting ovaries and uterus exert a protective influence; the decadence of the generative organs is attended with an increased proneness to the development of organic diseases, especially cancer. We may conjecture that the ovaries and uterus no longer exercising their normal functions and authority, morbid diatheses or organic defects hitherto latent or suppressed, break out, and absorb the remaining energies. Thus in another sense we discover that the menopause is a 'critical' or testing event."

Mr. Paget has shown that from forty-five to fifty is the age when scirrhus cancer of the breast occurs with greatest frequency, and a similar fact holds as to cancer of the uterus. But if the cessation of menstruation be a factor at all in the production of these results, ought they not to be observed in the case of women who cease to menstruate, as many do in some period of five years, say from thirty-five to forty, or from forty to forty-five, prior to the usual time of cessation? Dr. Barnes's explanation is ingenious, and seems quite rational, but probably cannot receive full credence until sustained and substantiated in the way we have suggested.

The tenth chapter is brief, and is upon the *Relation of Menstruation to Diseases*. There is scarcely any change in it from the first edition. Here, however, is an important new fact:—

"The modifications induced in the course of inflammation, acute or subacute, by menstruation, deserve careful attention. In several cases observed at St. George's Hospital, by Dr. Lacy, when my assistant, and myself, it was found that the temperature rose 1°, 2°, or 3° Fah. at every menstrual epoch. Hence we draw indication to moderate nervous and vascular tension at the menstrual epoch."

In the eleventh chapter we have presented various disorders of the ovary, such as displacements, inflammation, fibroid degeneration, tubercle, and cancer. In referring to prolapse of the ovary into the retro-uterine pouch, Dr. Barnes observes that he has frequently known the retroflected uterus to be mistaken for such displacement, and then says, "The diagnosis is made with certainty by passing the sound into the uterus. This done, if the mass is lifted away from the finger, and the fundus be felt supported on the sound by the hand above the symphysis, we know the case is retroflexion." Will not the finger in the vagina, and the direction of entrance of the sound into the uterine cavity, settle the question in so far as retroflexion is concerned, and might it not be well for less expert operators than Dr. Barnes to rest in the knowledge thus obtained without resorting to the further manipulations he advises?

The twelfth chapter is devoted to *Ovarian Cystic Tumours*. There are but two or three additions of new matter, and these relating to dermoid cysts.

The thirteenth chapter is chiefly occupied with *Ectopic or Retro-Uterine Gestation*. One might think that this was peculiarly a subject belonging to a work on obstetrics, and that a chapter on it in a volume upon diseases of women was itself a striking illustration of *ectopia*. But the explanation of its introduction is well given by Dr. Barnes when he

remarks, "For clinical purposes it is convenient to study ectopic gestation in connection with ovarian tumours. The diagnosis between them is often a pressing practical problem, upon the solution of which hangs the choice of the method of treatment."

In the course of the chapter Dr. Barnes gives just praise to Dr. Parry's work on *Extra-Uterine Pregnancy*, and narrates Thomas's interesting case of opening an extra-uterine foetal cyst through the vagina by the galvano-cautery knife, remarking that the proceeding is worthy of adoption.

Twice in the course of the chapter the *placental souffle* is spoken of. This *souffle*, discovered by Mayor and Kergaradec, was believed by the latter to depend upon the utero-placental circulation, and therefore termed by him *placental*. But Dubois demonstrated—we quote the statement from Depaul, *Leçons de Clinique Obstétricale*—that the *bruit* thus named occurred in the walls of the uterus; that it was heard generally upon the sides of the uterus rather than at the fundus, the usual place of placental attachment; heard too after the detachment of the placenta, and therefore termed it uterine. Recent obstetric authorities generally no longer speak of the *placental*, but of the *uterine souffle*. However, when there is an extra-uterine pregnancy, of course this *bruit* cannot be called *uterine*, but, on the other hand, what right is there to call it *placental*?

The fourteenth chapter is upon the *Fallopian Tubes*, or, as we prefer, the *Oviducts*<sup>1</sup> and their *Diseases*. In referring to absence of the oviducts, Dr. Barnes does not mention an interesting fact stated by Boinet, that such absence is never observed except when there is entire absence of the ovaries. This chapter chiefly differs from the corresponding one in the first edition, by rearrangement and some condensation of the matter.

The fifteenth chapter is entitled the *Natural Course and Termination of Ovarian Tumours*. Among these terminations is twisting of the pedicle, the cyst rolling over on its side, as Dr. Barnes expresses it. Several cases of this accident are adduced, and among them a recent one from Knowsley Thornton, in which this revolution of the cyst had occurred three times. But in the well-known works of Gallez, *Des Kystes de l'Ovaire*, a case is alluded to in which the twisting of the pedicle had occurred five times.

Although the title of the chapter is as mentioned above, yet more than two-thirds of it is devoted to the *Diagnosis of Ovarian Tumours*. Here we find that much new matter has been added. In summing up the diagnosis between a fibroid tumour of the uterus and an ovarian cyst, Dr. Barnes states the case as follows:—

"I think it may be affirmed with some confidence that a large abdominal tumour is uterine, if we get a combination of the following conditions: 1. Absence of the *facies ovariana*; metrorrhagia; solidity of the tumour; descent of any considerable mass into the pelvis; deviation of the os uteri; distortion of the lower part of the uterus; and especially if, with the above, the sound travels to an abnormal distance, or, in other cases, when the vaginal portion is effaced, the os uteri forms the centre of a rounded hard mass resting on the pelvic brim."

Now let the reader turn to page 281 of the late Dr. Atlee's work on *Ovarian Tumours*, and see how the world's greatest ovariologist, Spencer Wells, found this ovarian face where there was no ovarian, but a fibro-cystic tumour. Then, as to the second sign, in many cases of fibroid, especially

<sup>1</sup> The French perpetuate the *trumpet* origin in giving the name *Trompes de Fallope*, but our word tubes is not the synonym of trumpets.

fibrocystic, tumours of the uterus, there is no metrorrhagia. As to the third, sometimes we find the fibroid or fibro-cystic tumour surrounded with copious ascites. Where too there is such ascitic effusion, there may be no descent of the tumour into the pelvis. We write thus because we have known the diagnosis so thorny and difficult from the failure of many of the signs mentioned by Dr. Barnes, and it is rarely we can get them all combined in a given case of doubtful uterine tumour.

On page 274, a drawing from Dr. Drysdale is given, representing the microscopic characters of the fluid from an ovarian cyst. On page 372, Dr. Barnes remarks, "Dr. Fordyce Barker informs me that the 'characteristic ovarian cell' was found in the sac of an extra-uterine gestation recently operated upon in New York! Strong testimony is borne by Thomas, Byford, and Atlee to the general accuracy of Drysdale's test when applied by himself."

The *Treatment of Ovarian Cystic Disease* is the subject of the sixteenth chapter. Dr. Barnes does not seem to have much faith in the electrolytic treatment of ovarian tumours, a treatment of which was more heard a year or two ago than there is now. He observes, "Of uncertain efficacy in hydrocele, electrolysis does not promise much for the more difficult cases of ovarian cystic disease. Treatment in any case must be tedious."

Ovariectomy is given more space than in the first edition, and due importance and full descriptions of the antiseptic method are given. Keith is mentioned as a warm advocate of antiseptic ovariectomy, and stated as asserting that since he has operated under the carbolic acid spray, he "almost never drains." Considering the fact that he first suggested and so generally practised drainage, this testimony is peculiarly strong.

In speaking of the relative merits of silk and wire sutures for the abdominal incision, Dr. Barnes remarks, "It has happened to me to have to use both silk and wire in the same operation. I found that the wire sutures were more free from purulent tracts than the silver sutures." This conclusion is directly opposite from the one we heard Mr. Holmes announce, at St. George's Hospital, in the summer of 1864. A few days prior he had performed ovariectomy in the Hospital, using silver sutures, the patient died, and he observed at the *post-mortem* that in withdrawing the sutures, pus followed to the peritoneum.

Dr. Miner's process of enucleation of ovarian tumour is referred to favourably.

On p. 397 we find the following statement:—

"Walter F. Atlee, M.D., (*Amer. Journ. Med. Sci.*, 1877) relates a case, successful, in which he brought out as large a portion of the cyst as possible, clamped, cut it off, and carefully closed the wound behind it, trusting that the ovary would be sealed to the peritoneum of the ovary, and so close the peritoneal cavity." Upon referring to Dr. Atlee's report, he was not the operator, but Dr. Washington L. Atlee, was; and the description given by Dr. Barnes of the sealing process, is certainly not what Dr. Atlee wrote, and is by no means easy of comprehension. Dr. Atlee's language is as follows: "Trusting that by a very careful attention to closing the abdominal walls accurately around the cyst by the interrupted suture, the necessary peritoneal inflammation which would result, would seal the peritoneal coat of the ovary to that lining the abdominal wall, and in a day or two seal up the general peritoneal cavity."

*Vaginal Ovariectomy*, Dr. Thomas's operation, and *Normal Ovariectomy*, Dr. Battey's, are briefly referred to on p. 403. The latter is considered less briefly on a subsequent page.

In referring to drainage after ovariectomy, Dr. Barnes states that "J. F. Miner (*Buffalo Med. and Surg. Journal*, 1856) suggested a very well-designed plan of drainage. Having tied the pedicle as a whole, he carried the ends down through an opening made in *Douglas's pouch*, thus *inverting the part like a funnel*, and securing a drain for any purulent matter that might form." According to Peaslee, *Ovarian Tumours*, p. 438, this was done by Dr. Miner in 1866. But Dr. Handyside, of Edinburgh, did it in 1846.

Dr. Barnes states among the *accidents after ovariectomy*, that "in two cases *tetanus* proved fatal." But in the second volume of the *Transactions of the American Gynecological Society*, twelve cases of fatal tetanus are tabulated.

In the eighteenth chapter—*General Observations on Uterine Pathology; Effects of Labour and Lactation; Involution in Defect and Excess*—Dr. Barnes considers the prophylactic treatment of uterine non-involution, thus:—

"By proper care immediately after labour and during child-bed, involution may be effectively promoted. The first care is to see that the uterus is emptied of placental remains and clots. The second point is to secure firm contraction by compression and by the administration of ergot, quinine, digitalis, or strychnine. For many years it has been my practice to give these remedies two or three times a day from the very first. They help not only to lessen the remote dangers of imperfect involution, but also the immediate danger of septicæmic puerperal fever. The third point is to support the strength of the patient by liberal diet. The fourth is to insist upon *rest* for two or three weeks. And, lastly, to be satisfied that the uterus is not prolapsed or retroverted. If retroversion or retroflexion, a very common condition in child-bed, be allowed to continue, involution will surely be arrested."

The nineteenth chapter is one of the longest in the book, and is upon *Conditions marked by Altered Vascularity or Blood Supply*: it presents no important additions, but still maintains those nice distinctions as fluxion, hyperæmia, congestion and engorgement, which are dwelt on so earnestly by both Courty and Barnes, but which are probably difficult of just appreciation and discrimination by the average medical mind.

The most important addition to the twentieth chapter, the subject of that chapter being *Pelvic Inflammation*, is a presentation of the views of Dr. Næggerath as to latent gonorrhœa.

"In this place reference must be made to the doctrine of latent gonorrhœa, set forth by Dr. Emil Næggerath. He submits that gonorrhœa apparently cured, may persist in certain sections of the organs of generation, in the male as in the female, for life, constituting "latent gonorrhœa," that in this form it may infect a healthy person with acute gonorrhœa or gleet; and that in the female it may run from the latent into the apparent form, and give rise to acute, chronic, or recurrent perimetritis or ovaritis. It is obviously difficult to prove or to disprove how far the doctrine can be substantiated. I cite it, believing that it has at least an apparent basis in facts; and that the subject is worthy of further investigation."

*Perimetric Hæmatocele* is discussed in the twenty-first chapter. This is a subject which has been most diligently studied by Dr. Barnes, both clinically and in the writings of others.

In entire correspondence with the teachings of others he mentions perforation of the vagina and of the rectum as furnishing exits for the blood tumours. In a case under our own care more than a year ago where we had diagnosed hæmatocele, the discharge took place through the bladder. Although the time and the place are not now presented for giving the



details of this case, yet there is no antecedent improbability of such way of discharge. Pelvic abscesses may thus find exit for their contents, and take Chassaignac's case of hæmatocele—the blood occupying the vesico-uterine space—other avenue for escape, if escape at all, than through the bladder, could not be found.

The twenty-third chapter is upon *Inversion of the Uterus*. Dr. White's method is given proper consideration, but we regret there is no illustration of his "repositor," which, in our opinion, is the most valuable of all instruments for the reduction of uterine inversion. But we regret still more to find a repetition on page 633 of Dr. Barnes's statement made in the first edition, as to *forcible taxis*:—

"Of late years a proposition has been made, supported by several distinguished American physicians, to admit this method to a recognized place in the treatment of chronic inversion. The fact that death after rupture of the uterus or vagina has several times been the consequence of forcible taxis should alone be sufficient to discredit the method. . . . Forcible reposition has been attempted either by the hand alone or by aid of a *repoussoir*, that is, some kind of blunt instrument of wood or ivory. Depaul (*Gaz. des Hôp.*, 1851) used a *repoussoir* in a case eleven days after labour. The patient died in a few days from rupture of the uterus. Laceration has also occurred in several cases in America."

In Dr. Weiss's monograph, *Des Reductions de l'Inversion Uterine*, Paris, 1873, two cases of acute inversion of the uterus which Depaul reduced by his *repoussoir* are given; one patient recovered, and the other (this is the one mentioned by Dr. Barnes) died. And at any rate what have any cases of acute inversion to do with the subject the paragraph started to consider, viz., forcible taxis in chronic inversion? Moreover, after having described Dr. White's repositor, is it just to define the repositor, even though calling it by a French name, as "some kind of blunt instrument of wood or ivory?" We fear Dr. Barnes has been misinformed, and we believe he has done unintentional injustice to American physicians; we sincerely hope, nay we firmly believe, that in the next edition he will materially modify the paragraph we have quoted.

In the chapter upon *Tumours of the Uterus*, the twenty-fourth, the author remarks in regard to Battey's operation: "It is, perhaps, premature to offer an absolutely adverse opinion upon this operation. Peaslee and Emmet, speaking from observation *ad hoc*, as well as with the authority justly due their vast general experience and their steady judgment, accorded it only a qualified sanction." Koeberlé, *Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques*, gives the operation of Dr. Battey more commendation, regarding it as theoretically quite just. He mentions, too, that he himself performed normal unilateral ovariectomy in 1869.

Following this chapter we have one upon *Uterine Polypus*, and then we have four chapters on *Tubercle of the Uterus*, *Cancer of the Uterus*, *Diseases of the Vagina*, and of the Vulva. In the one upon *Vaginal Diseases* the most important additions have been made, and among them are three illustrations of perineo-plasty taken from Thomas's well-known work.

But this review has already been protracted beyond original intention, and it must now terminate.

T. P.

## ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXIV.—*Guy's Hospital Reports*. Edited by H. G. HOWSE, M.S., and FREDERICK TAYLOR, M.D. Third Series. Vol. XXIII. 8vo. pp. xx., 402. London: J. & A. Churchill, 1878.

ACCORDING to our custom we will analyze the Surgical papers and those which interest the physician separately. And first the surgical papers.

MR. W. A. BRADLEY opens the volume by a paper on *Astigmatism in its relation to Headache and to Certain Morbid Conditions of the Eye*. We find nothing especially new in the paper, but the iteration of well worn truths is in itself a service especially when dealing with conditions that may exist, and yet be totally unsuspected by the sufferer from them.

The next paper is by C. HIGGENS, with a title which in its contempt of the article is singularly bad English, *On Tumours of Orbit and neighbouring parts*. Four cases are given as addenda to seven already published in the *British Medical Journal* Dec. 8. 1877. The first case was one of Distension of the right Frontal Sinus. An incision gave exit to a large quantity of opaque yellow tenacious fluid and a cure was effected by forcing a passage into the superior meatus. The 2d and 3d were cases of round celled Sarcoma of the Orbit both of which were progressing when last seen.

The 4th was a very rare form of disease—a Hydatid Tumour of the Orbit. Four years before admission, the left eyeball began to protrude and had grown rapidly for the last three months. The lids could be closed over the ball. A firm somewhat nodular growth was felt between the orbit and the ball at the lower and outer margin. The ophthalmoscope showed a choked disk, followed later by atrophy of the nerve. The diagnosis was a sarcoma. After being under observation for nine months the tumour became fluctuating and was then opened freely when a number of hydatids escaped, and in two months he was well but he did not recover his sight. As Mr. Higgens points out, the diagnosis is in such cases always very obscure but may be assisted by an exploratory puncture. Had an early operation been done the patient's sight might probably have been saved.

*Stricture of the Urethra* is the familiar title of the next article by Mr. J. COOPER FORSTER, who is moved "to go back to some old and well-established truths" in reference thereto. First of all he doubts the genetic relation of gonorrhœa to stricture on the grounds that many who have the former do not suffer from the latter, that "a certain proportion of patients, a small one it is true, have had no gonorrhœa" and but few who have stricture, have had prolonged urethral discharge. We suspect but few will agree with him in his doubts, as also in his assertion "that the common seat of stricture is in the bulbous or membranous portion of the urethra," whereas relatively but few strictures are found in the membranous portion. In place of gonorrhœa he invokes "too frequent sexual intercourse as a more potent cause of stricture as the middle or later periods of life are reached" on the ground that "the stricture segment, so to speak, is, as it were, poised between the cavernous tissues in front and the prostatic part behind and in all the changes of position which occur in erection of the organ, extreme or moderate, there is a certain amount of stretching and dragging about this spot."

Surely were this so there ought to be a large instead of a small number of patients who suffer from stricture without any preceding gonorrhœa.

Moreover he is no believer in "strictures of large calibre," for he says "a large number of patients are said to have stricture . . . who have nothing of the kind *or at least* [the italics are ours] in whom a No. 6 or 7 catheter can be easily passed." Has Mr. Forster ever used a bougie à boule?

He has done external urethrotomy only once in the last seven years "and then regretted it afterwards" and has never performed internal urethrotomy. He relies on the hot bath, opium, and gradual dilatation. The paper will do good by its conservatism in an age of aspiring novelties of treatment, but we are not of the pessimists who see little or naught but evil in to-day and to-morrow and sigh for "the good old times" of our grandfathers.

One of the best surgical papers in the volume is by Mr. W. H. A. JACOBSON on *Supra-Condylloid Amputation of the Thigh*. In nothing is the progress of surgery more marked than in its nice distinctions in operative procedures whether as conducive to life, or to the usefulness of resulting stumps, their adaptation to various injuries and diseases, their facility of performance or avoidance of dangers. In this Journal for April, 1868, Dr. J. H. Brinton of this city drew attention carefully to "Amputations at the Knee-Joint and the Knee," and the present paper is practically an additional contribution to the subject. We must be careful to distinguish (1) disarticulation at the knee-joint; (2) Carden's and Gritti's operations which are *trans-condylloid* amputations, and (3) Stokes's modification of Gritti's method, which is a *supra-condylloid* amputation from half an inch to an inch above the condyles. Its chief recommendation is that it may often supersede amputation higher up in the thigh, for it can scarcely replace a knee-joint disarticulation. Its advantages are that it does not open the medullary cavity of the bone, and so diminishes the dangers of osteomyelitis; it retains much of the adductor power lost in higher amputations; the patella being retained and its posterior surface sawn away so that it anchyloses with the sawn end of the femur, the flexor power of the thigh (rectus) is not lost; and healing takes place quickly, there being no absorption of the cartilage necessary and the flaps being less apt to slough. As in England, so in this country, this modified operation has been too much neglected.

Mr. C. H. GOLDING-BIRD next relates three *Selected Cases*. The first is that of a boy, aged 14, who fell and was brought in insensible but without paralysis or fracture. On the sixth day a fluctuating swelling was discovered at the middle of the lower edge of the left parietal bone. Pressure here produced right lateral spasm excepting the face, and Mr. Bird trephined over this spot. There was an ounce of blood on the bone separating the pericranium from it and a clot between the bone and the dura mater. In seven weeks the boy was discharged well. An excellent illustration of the results of well-timed surgical interference. The second case was one of charbon followed by recovery in which the blood was repeatedly examined microscopically. M. Pasteur's statement that charbon is a disease caused by bacteria in the blood was not confirmed by this case. No bacteria were observed except from a puncture on the surface covered by the poultice. The poultice in at least one case had been on for only an hour, did not smell badly, and had scarcely any discharge. An excellent commentary on the value of the antiseptic dressing. The third case was one of probable hernia of the right ovary. The tumour was first noticed in the morning after a preceding day's hard work. It was at the internal ring, was half an inch long, firm, tender, with impulse on coughing, irreducible and immovable, and the seat of constant pain which was increased at the menstrual period. No definite information could be obtained from a vaginal examination. The tumour was removed about four and a half

months after its appearance, and she made a tedious recovery. Eventually she suffered quite as much from pain in the left ovarian region.

Mr. HENRY DAVY, who was dresser to Mr. Howse, presented a paper entitled *Five Cases Illustrative of Antiseptic Surgery and Pyæmia* for the Gurney-Hoare Prize for 1877. He won the prize (deservedly as it seems to us), and a part of it (yet it covers sixty printed pages) is here presented with remarks by Mr. Howse. The paper opens with a discussion on pyæmia and then the antiseptic dressings as used by Mr. Howse are described. These differ from Mr. Lister's in abandoning the mackintosh and substituting for his eight layers of gauze from 10-16 of oiled gauze (1-20) and in addition 10-16 of dry gauze that is from 20 to 32 layers in all! We can scarcely think this an improvement, and the cost is greatly increased. The chief end of the oiled gauze seems to be to prevent adhesion to the edges of the wound. But no mention is made of the use of the "protective," and to us this seems quite as useful in preventing such adhesions as in guarding the wound from the irritant action of the acid. The eight layers only may be used, adhesions prevented by the protective, and the cost materially lessened by various substitutes for the mackintosh.

The first case reported was one of cancer of the breast. It eight days it was all healed except the drainage orifice, no noteworthy rise of temperature having occurred. The second was one of left oblique inguinal omental hernia, which was operated on, the omentum being tied with carbolized catgut and cut away. The temperature only once rose to 100.8°, but the recovery was prolonged owing to a small piece of the omentum sloughing. The third case was a curious one of painless incomplete fracture of a rickety tibia, which gave rise from the patient's inaccurate history of his case to a doubtful diagnosis of either a rapidly growing tumour of the bone or a localized periostitis. An exploratory operation revealed the fracture. He was saved an impending amputation and recovered readily, having had no fever. The fourth case was one of trephining over the right parietal eminence for incurable epilepsy of traumatic origin. He recovered, having had a temperature at no time over 99.4°, but with little good result so far as the epilepsy was concerned. The last case was one of pyæmia attended with a rash which simulated strongly scarlatina, but was possibly pyæmic, the pyæmia itself arising from osteomyelitis. Each case is followed with excellent though it seems to us (for Guy's Hospital Reports at least) needlessly long discussions. That following the last case will repay careful reading.

In the volume of the *Reports* for 1876 (see this Journal for January, 1877, p. 186), Mr. R. CLEMENT LUCAS reported a *Case of Fracture of the Skull followed by a collection of Cerebro-spinal Fluid beneath the Scalp*. The case having since terminated fatally (as was then prognosticated) Mr. Lucas now gives us the *sequel*, fulfilling the witty French idea that "no case is complete without a post-mortem." She was readmitted in July, 1876, a year after the accident, with the deep fracture still preceptible, as was also a small remnant of the tumour formed by the cerebro-spinal fluid, though it was scarcely evident except when she cried. In the following May she was admitted a third time, and died after four days of acute meningitis. The skull was asymmetrical, bulging considerably on the injured side. The fissure involved the parietal bone, the squamous portion of the temporal and the sphenoid, and was at one place five-eighths of an inch wide. The temporo-sphenoidal lobe was occupied chiefly by a large dilatation of the lateral ventricle, its walls were reduced to a thin layer of brain substance, and were everywhere adherent to the membranes. Probably at the time of the accident it was reduced to a pulp, and the most remarkable fact was that the child lived for nearly two years.

W. W. K.

We shall next invite attention to the medical papers in the volume.

In the first of these Dr. FREDERICK TAYLOR reports an interesting case of *Unilateral Atrophy and Spasm*. The patient was said to have been in good health up to her fifth year. At that time, during convalescence from an attack of scarlatina, she had a fit of convulsions which lasted somewhat less than an hour, and was followed by a state of semi-consciousness of three or four days' duration. On recovery the left arm and leg remained paralyzed; they gradually, however, regained power, so that at the end of two months she could move the arm freely and walk without assistance. After some months the limbs contracted, and she had in consequence a permanent limping gait. In course of time she married and had three children, and it was while pregnant with her last child that the first symptoms of consumption, of which she eventually died, showed themselves. When she first came under Dr. Taylor's care, it was at once seen that the left upper extremity was much smaller than the right, and was kept close to the side. The forearm was flexed upon the arm, and the hand slightly bent on the forearm; she was unable to straighten the limb at either of these joints, though a limited amount of voluntary power over them remained. If forcibly extended by another person the fingers quickly returned to their original position. They were besides subject to constant slow irregular movements. She managed, however, to put the limb to some use, being able to hold, for instance, crocheted work in the left hand while she passed the needle with the right. In the lower limbs the alterations were less marked, the left limb was wasted and there was a slight degree of talipes equinus. Her mind seems to have been unimpaired.

At the post-mortem examination, in addition to the lesions of phthisis, the following changes were found in the brain and spinal cord. The right hemisphere was in all its dimensions smaller than the left. On laying open the ventricles, a striking difference was noticeable in the size of the central ganglia. The outer part of the right corpus striatum was flattened and atrophied, and on section at this point it was found that there was an ill-defined cavity in it, in which a number of vessels lay with filamentous connective tissue around them, but no cerebral substance supporting them. The crura cerebri and the anterior pyramids of the medulla oblongata agreed with the cerebrum in presenting atrophy on the right side, the right pyramid being scarcely more than half the width of the left, but in the case of the cerebellum it was the opposite or left half which was smaller in all its dimensions than the right. The measurements of the pons gave much less certain indications; the difference between the two sides was relatively small, the right being the larger. In the spinal cord the atrophy was on the same side as that of the cerebellum; it was very striking in the cervical enlargement; but no appreciable difference could be detected between the two sides in the dorsal and lumbar regions. The difference in size was upon section found to concern the anterior gray cornu and the antero-lateral column, especially in its anterior half. Under a high power Dr. Taylor could detect no essential difference in any one respect between the elements of the cord on the two sides. The number and size of the ganglion cells were almost identical. There was nowhere any degeneration; and the dorsal and lumbar regions were distinguishable in no respect from those of a healthy cord. Transverse sections of the pons varolii showed in a remarkably striking manner the difference of the vertical bundles in the two sides. Sections from the two sides of the cerebellum were made at the same time, the only difference noted on the atrophied side were these: The granular layer was somewhat less broad, and took a deeper-carmine colour; Purkinje's cells were more faintly stained, but identical with those of the sound side in size, number, nucleation, and structure of processes; the cells of the corpus dentatum were smaller, but not less in number. The minute examination of the other

parts of the encephalon was unsatisfactory; owing to their having been kept in spirit for some time.

Dr. Taylor thinks the conclusion unavoidable, that the disease in the corpus striatum was primary, and that the atrophy of the other parts of the brain as well as of the osseous and muscular structure was secondary. This case therefore supports the view of Lallemand and Schroeder van der Kolk, that the disease is not always congenital, but may arise after birth, and is also confirmatory of Cotard's opinion, that partial atrophy of the brain is not a primary affection, but the result of inflammatory, traumatic, or other lesions. "As to the exact manner," the author says, "in which the secondary atrophies, whether of the nerve centres or of the limbs, are brought about, the case adds little to what can be gathered from other instances. Schroeder van der Kolk discusses the origin of the deficient growth, and concludes, no doubt correctly, that the shortening and atrophy are caused not only by the inaction of the paralyzed muscles, but also as a direct result of the injury to the nervous system acting through the nutritive system of nerves." He was led to this conclusion by finding that the bones of the fingers and forearm, which are naturally the more mobile, and therefore might be expected to suffer more from inaction, are in these cases the least shortened.

In regard to the more striking features of the case, the atrophy of the cerebellum on the side opposite to that of the cerebrum, the author says that "though well known as a pathological occurrence, this crossed connection of the cerebrum and cerebellum is not generally described in our text-books on anatomy. Meynert, however, not only confirms Stilling's statement that the inferior peduncles undergo a complete decussation beneath the upper pair of the corpora quadrigemina, but also shows that both remaining peduncles cross over to the opposite side in order to connect the cerebellum, in the one case with the vertical bundles of the pons, and in the other with the posterior columns of the cord."

The author devotes a good many pages to the discussion of the physiological questions suggested by the case, which the student of nervous diseases will do well to read. He also appends to his paper the reports and an analysis of nine other similar cases which were observed in the wards of Guy's Hospital.

Under the name of *Chronic Intermittent Albuminuria* Dr. Moxon describes a condition which he says is not uncommon among young men, and which doubtless also occurs in the other sex, although his experience does not enable him to assert this. The urine is in these cases not always albuminous, but is usually so after breakfast. It generally contains a large quantity of oxalate of lime crystals, but apparently never true casts. The symptoms accompanying this condition are very indefinite. The patients are said to be listless, to complain of headache, and to look rather anæmic and gray, and sunken about the eyes. They sleep too much, and rise unrefreshed, and are too ready for rest during waking hours. They are also indisposed to avail themselves of cheerful company. As a rule, they do not regard themselves as sick, being generally brought to the physician by their friends, who regard them as "out of condition." In all the cases which the author has had the opportunity of observing for some time, recovery has taken place. In one or two, indeed, the patient has subsequently undergone a serious illness without any return of the complaint.

In concluding his paper, Dr. Moxon says: "The occurrence of the albuminuria, at a period of life when the sexual system is completing its development, and further, when its aptitudes are not always under normal control, may raise questions of causation of a kind difficult to obtain certain answers to. Starting so near each other, and with so much of close relation in their development, and with common rights of way, so to speak, over not always normally governed passage apparatus, disturbances of the sexual system might be allowed as likely

to reflect disturbances on to the urinary system. The common persistence of nocturnal incontinence of urine in boys until puberty shows how the arrangements for the urine may depend upon sexual completeness." In support of this view, the author refers to the fact pointed out by Rokitsansky that there is an association between renal tumours and tumours of the testis.

Dr. TAYLOR is also the author of a paper entitled *A Contribution to the History of Idiopathic or Pernicious Anæmia*, in which he gives the histories of several cases of the diseases which were treated at Guy's, and which have not hitherto been published, and shows conclusively, which indeed every well read physician knows, that Addison was the first to describe it, and that its occasional occurrence was fully recognized by Wilks and the other physicians to the Hospital long before the appearance of Biermer's paper. Dr. Addison gave to the disease the name of Idiopathic Anæmia, which seems to us preferable to that of Progressive Pernicious Anæmia, bestowed upon it by Biermer, inasmuch as remissions sometimes take place in the course of the disease, during which the patient may be restored to a moderate degree of health. This occurred in two cases which were under the writer's care.

In a *Report on Cases of Tetanus Treated in Guy's Hospital*, the same gentleman subjects fifty-one cases of the disease to a critical examination, for the purpose of determining whether or not drugs have any value in its treatment. Only eight cases out of the fifty-one recovered. The remedies administered in these cases being as follows: In 1, Calabar bean; in 1, Calabar bean and chloral; in 1, Calabar bean, chloral, and morphia; in 1, chloral; in 1, chloral and iodide of potassium; in 1, opium; in 1, curara; and in 1, nitrite of amyl. The tables which illustrate the paper show, however (1) that more recoveries occur amongst cases of slight injury than among cases of severe injury; (2) that more recoveries occur amongst the cases in which the tetanic symptoms follow late upon the injury than amongst those in which they come on quickly; (3) that a more slow and chronic type of disease is more frequent amongst cases of mild injury than amongst cases of severe injury. The author is inclined to think that the proportion of cures would have been larger if curara and Calabar bean had been given in larger doses. In the case in which recovery followed the use of the latter drug, it was given in doses of from 1 to 2 grains every three hours for thirteen days, until 125 grains had been taken. On one occasion the patient had seven successive doses of 1 grain each at intervals of fifteen minutes. Curara has been given in Germany hypodermically, in doses of  $\frac{1}{3}$  of a grain every fifteen minutes, in cases of hydrophobia, but, in the cases reported in this paper, it was administered in doses only of from  $\frac{1}{8}$  to  $\frac{1}{16}$  of a grain.

The only contribution from Dr. SAMUEL WILKS to this volume is one entitled *An Account of some Unpublished Papers of the late Dr. Hodgkin*. Most of these were written about the time of their author's retirement from Guy's Hospital, nearly fifty years ago, and are consequently antiquated, while the opinions expressed in them are in some instances obsolete, and the statements superseded by those derived from modern research. We find enough, however, in the extracts which Dr. Wilks has made from them to confirm the high opinion which we have hitherto entertained for the learning and for the powers of observation of their distinguished author, and cannot but regret that his career as a pathologist should have been so brief. His name is usually associated with the disease known now as lymphadenoma; but Dr. Wilks shows also that there is also good reason to believe that he was the first observer of the lesion of the heart producing aortic regurgitation, and it is certain that he so regarded himself. In a paper written more than forty years ago he partly anticipates the discoveries of leucocythæmia. "The whitish corpuscles," he says, "are intimately connected with

the lymphatic system. I have found them particularly conspicuous in a case where the lymphatic glands throughout the body were remarkably large."

*The Treatment of Insanity, more especially by Drugs*, is the subject of a paper by Dr. GEORGE H. SAVAGE, in which he urges the necessity of a prompt removal of the patient from his home as soon as decided symptoms of the disease have manifested themselves except in cases of the very young, to whom the associations of an asylum are often demoralizing, of the hysterical or of those in whom the disease evidently depends on some definite physical state that may pass off or be cured in a short time. The author has found the shower-bath useful in some cases of acute mania in young persons who have good appetites and are in fair general health, many of whom are noisy, obscene and destructive, also in the convalescence from acute mental disease. It may frequently be employed in cases of melancholia, but here, he says, special care must be taken that there is sufficient bodily power to insure healthy reaction, otherwise harm may be done. On the other hand it should never be resorted to for patients suffering from general paralysis or from the insanity of decay such as phthisical or senile. In regard to morphia, the author says, it has served him well in cases of active melancholia where sleeplessness alone seems to be the cause of the mental break-down, or where the insanity is the result of chloral taking or of over-stimulation. In ordinary acute mania, general paralysis, profound melancholia, and partial or complete dementia it is of no avail. It is sometimes more efficacious when administered hypodermically, at others when given by the mouth.

Chloral, the author has found most useful in the epileptic status, in the furore of epilepsy, and in some cases of insanity from excess of stimulants (in these cases large doses may be required to produce sleep, and at the same time large doses are rather dangerous). It is also useful in some cases of exhaustion following prolonged restlessness, and in some cases in which the mental symptoms result from other causes that may be relieved by sleep. In some puerperal and some senile cases chloral may be of service in preventing rapid exhaustion. Equal parts of camphor and chloral were given with good results to patients who were destructively maniacal and who were filthy in their habits, and secondly to those who were erotic or lascivious in action; the combination in these cases often producing quiet, although this quiet was generally but temporary, and preventing the loss of appetite and flesh which often followed the prolonged use of chloral alone. In a few cases, however, the patients to whom it was given became pugnacious, and several who up to the time of its administration were only destructive of property became dangerous to persons.

Dr. Savage's experience has not been very favourable with conium or physostigma, while it has been decidedly unfavourable with hyoseyamine, the active principal of hyoseyamus. In some dull cases, in which the patients are depressed and without energy, a weak, continuous current passed from forehead to nape has, he says, roused the patient and done good, and in one or two cases of acute primary dementia satisfactory results have followed; one patient distinctly saying that after several months of complete mental blank his first returning sensation was of the current. He thinks that in convalescent cases this treatment may be of service, both from its own effects and from the concentrated attention of attendants and patients. In some cases the author has seen an improvement in the symptoms take place coincidently with the occurrence of some physical disease, and a relapse to occur when this was relieved. He calls our attention to the facts that insanity may be due to constitutional syphilis, and where this is the case it will resist all other than antisyphilitic treatment.

In his *Note on some Cases of Diastolic Bruit*, Dr. JAMES F. GOODHART thus describes a murmur to which he wishes to call especial attention:—



"It is," he says, "usually a blowing bruit, most intense at the apex, but often audible over more or less of the præcordial region even to the base; it is not audible behind, is diastolic in time, and always follows immediately upon a well-marked, generally loud, systolic apex bruit of regurgitant type, and occasionally so obscures the second sound that it is not appreciable between the two. It is a to-and-fro bruit at the apex similar in rhythm to the to-and-fro bruit at the base in disease of the aortic valves; and the closeness of this resemblance is shown by the fact that the mitral to-and-fro has several times been considered during life as of aortic origin by experienced auscultators."

This murmur, which is distinct from the presystolic, has been recognized by Marey, Galabin, and Hilton-Fagge, and is thought by these observers to be due to mitral contraction, but in the author's opinion it may sometimes be heard when this is not present. The following is his explanation of its mechanism:—

"The conditions which are necessary for the production of such a bruit de soufflé appear from Marey's experiments above alluded to, to be a septum partially obstructing the auriculo-ventricular opening, and auricular pressure in excess of the ventricular. These are conditions which quite correspond with those present, where the mitral valve is contracted; but it is theoretically possible to conceive that with a hypertrophied left ventricle, the auricular pressure might be raised to such a pitch in regurgitation without obstruction, that if dilatation of the ventricle were also associated with it, an auriculo-ventricular opening of normal dimension, or even larger, might, with its flaps and tendinous ends, play the part of a septum with which to generate a bruit. With reference to an aortic diastolic bruit moreover, it would seem from the experiments of Chauveau that there is no necessity for the presence of any septum for its production. There is a disproportion between the containing cavity—the aorta and the receiving cavity—the ventricle; and there is excess of pressure in the former during early diastole: under such conditions a sonorous 'veine fluide' would be generated as the blood passed from the aorta back into the ventricle. But if this is true with regard to the aortic orifice it is true also, though less generally applicable to the mitral. The left ventricle is capable of a relative dilatation with regard to the auricular ring and mitral flaps, and under these circumstances, therefore, one might expect an occasional bruit de soufflé in the early part of the diastole, when the auricular pressure is high as the result of the regurgitation. The more dilatation, provided that the ventricle is acting sufficiently well to expel its contents completely, the more likely is the diastolic bruit to occur."

From the *Statistical Analysis of the Patients treated in Guy's Hospital during the Year 1877*, we learn that the total number of patients who have participated in the benefits of the hospital during the year amounted to 79,605, of whom 5544 were under treatment in the wards. The figures show a lower mortality than has been recorded since 1868. The deaths during the year amounted to 498, or 9.95 per cent. of the total number.

J. H. H.

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ART. XXV.—*St. Thomas's Hospital Reports*. New Series. Edited by Dr. PAYNE and Mr. MAC CORMAC. Vol. VIII. 8vo. pp. xiv., 702. London: J. & A. Churchill, 1878.

THE previous volumes of this series were issued in paper covers, the present volume comes to us bound in muslin—a change which no doubt will be an agreeable one for many of the subscribers. Among the contributions to this volume will be found an unusual number of practical interest, among which may be specially mentioned the papers of Drs. Peacock, Ord, and Harley.

We shall notice the medical and surgical papers separately. First among the

former is a paper by Dr. THOMAS B. PEACOCK, entitled *Statistical Report on Cases of Chorea*, in which he subjects to a critical analysis ninety-two cases of the disease observed by him since the publication of his paper in 1863, in the *British and Foreign Med.-Chir. Review*. Inasmuch as the inferences which the author draws from these cases do not differ materially from those which have been deduced from other similar collection of cases, we shall only refer to a few of the more important of them. Thus a majority of his cases occurred in females, and this difference in the liability of the two sexes to be affected by the disease was noticed as well before as after puberty. In twenty-four cases the patients had had rheumatism, and in two other cases the chorea appeared after the patients had got wet, but the author is evidently of the opinion that the connection which undoubtedly exists between chorea and rheumatism is not to be traced through the heart disease, which is so frequent an accompaniment of the latter. "On the contrary," he says, "in some of the cases in which the attack commenced with rheumatism, the heart's sounds and action were stated to have been quite healthy, and in some of those in which there were decided evidences of heart disease, the patients had never had any rheumatic symptoms either previous to, or during the choreic attack. This seems to indicate that rheumatism rather gives rise to chorea by directly affecting the brain and spinal cord or their membranes, than by causing heart affections, and so secondarily involving the nervous system." Three of the ninety-two cases resulted fatally, the others recovered or improved under treatment.

Mr. WILLIAM H. STONE's *Remarks on Pleural Tension* seem to have been suggested by the fact that occasionally little or no fluid comes away from the operation of paracentesis thoracis performed only with an ordinary trocar, even in cases where a large amount of effusion is known to exist in the pleural cavity. The paper is doubtless interesting to the student of pneumo-dynamics, but it does not admit of analysis, and we must therefore dismiss it with this brief notice.

The volume contains two papers *On the Treatment of Acute Rheumatism by Salicylate of Soda*. The first of them is contributed by Mr. SEYMOUR JOHN SHARKEY, who gives the results of the treatment of this disease by salicin and its derivatives as observed at St. Thomas's Hospital. The drug, it need hardly be said, is found most useful in acute cases, in which the temperature is high and the pain excessive. In these cases a marked subsidence of these symptoms rapidly takes place—sometimes in less than forty-eight hours after the commencement of the treatment. The author admits that its use may occasion delirium in a few cases, and also in consequence of the profuse diaphoresis to which it gives rise, may be accompanied by a general miliary eruption, which very often becomes pustular. Although it has not the power to prevent cardiac complications, it certainly appears to diminish the liability to them. On the other hand, there is no reason, in his opinion, to attribute to it the albuminuria which is occasionally noticed during its use, since albuminuria is now known to be a frequent attendant upon all diseases characterized by high temperature. For instance, out of ten cases in which albumen was present, seven had it before the drug was administered, and it disappeared in all these, while the urine still gave a strong reaction with the perchloride of iron. The author has also not been able to verify the assertion, which has been recently made, that it gives rise to glycosuria. He prefers the sodium salicylate to salicylic acid because it is more agreeable to the taste, and is generally better borne. He gives it in doses of 20 grs. repeated every two or three hours.

The author of the second paper is Mr. ERNEST H. JACOB, who tabulates one hundred and fifty cases of the disease treated in the wards of the Leeds Infirmary by salicin and its congeners. The effect of the treatment is reported to have been

good in one hundred and three of the cases, moderate in forty-two, and unfavourable in five. In only five of seventy-two cases admitted with healthy hearts did a cardiac complication occur after the medicine was given. In common with Mr. Sharkey, he believes that relapses may occur after this treatment, especially if it be discontinued immediately on convalescence. In the rapidly fatal cases, where delirium and hyperpyrexia are the most prominent symptoms, he has not been able to satisfy himself that it is of the slightest use.

For the sake of convenience we shall next notice an Essay<sup>1</sup> by THEODORE ACLAND, M.A. Oxon, *On Salicylic Acid, with some Observations of the Effect produced by the Drug on the Elimination of Urea*. After narrating the circumstances which led to the discovery of salicylic acid, the author discusses at some length its therapeutical properties and those of salicylate of soda. He shows that while the former possesses antiseptic properties to an eminent degree, the latter is entirely without them. Thus Prof. Thiersch has found that the antiseptic effect of salicylic acid dressings is quite as reliable as that of Lister's carbolic acid. At the same time the salicylic acid has two advantages; it is less irritating, and it is not volatile. It can also be combined in large quantities with the dressing, and the latter can be left on longer than the carbolic dressing without endangering the result. A further recommendation with many will be the fact that salicylic acid is free from smell.

It does not appear to have any antiseptic properties when administered internally, as for instance in pyæmia, which is probably due to the fact that it unites with the alkalies of the blood to form the salicylates, by which a great part of its efficacy is destroyed. The author points out that this effect may be prevented by giving it in combination with the acid potassium sulphate, or with hydrochloric acid, with a view of giving the salts of the blood something with which to combine, while leaving the acid free.

In the treatment of rheumatism the author has found salicylate of soda much more efficacious than salicylic acid. He believes that it is never in the doses in which it is usually given the cause of albuminuria, which frequently disappears under its use, and which is to be regarded simply as a consequence of the high fever. It diminishes the tendency to cardiac complications if given early, and prevents the extension of these when already set up. It likewise reduces the mortality of the disease. Relapses are, however, very apt to occur, especially if the salicylic treatment is not continued for some days after the temperature has been reduced.

In all these points it will be seen he is in accord with the two observers whose papers have already been noticed. He, moreover, comes to the following conclusions: 1. The diminution in the active processes of fever is followed by diminution in the total quantity of urea excreted. 2. The percentage amount of urea excreted remains (where the diet is regular) but little affected by this drug, or reduction of temperature. 3. The reduction of temperature is consequent on diminution of pain. 4. Salicylic acid acts as an opponent of the causes of rheumatic pain, whatever they may be, and only acts secondarily as an antipyretic. 5. The quantity of the urine is diminished directly or indirectly by the drug.

Experience has shown that it is powerless against variola, and that it cannot compete with quinia as a specific against ague and malarial poisons. It has also been proved not to have a beneficial effect on typhoid fever. In fact the author says he has yet to learn that it produces any other results in this fever than "delirium to the patient and disappointment to the physician." This he attributes to the fact that the elimination of urea is lessened by salicylic acid. "In rheumatic fever," he says, "the system can tolerate for a short time the non-

<sup>1</sup> This essay was read before the Physical Society of St. Thomas's Society, and to it was awarded the Society's prize.

elimination of the nitrogenous decomposition products, notably urea, and in enteric fever it cannot. In the one case there is often reduction of temperature and acute delirium. In the other reduction of temperature, and often cure."

One of the most important papers in the volume is *On the Use of the Graduated Bath for the Reduction of High Temperature in Fevers*, and is by Dr. WILLIAM M. ORD, one of the physicians to the Hospital. By the term "graduated bath" is meant a bath in which the temperature of the water at the time of immersion is at some point between 90° and 100° Fahrenheit, and is gradually lowered by from 25° to 30° during an immersion of half an hour's duration. A bath at this temperature, the author contends, is safer than one at 55° or lower, which may often prove dangerous from shock. In common with Politzer (see number of this Journal for October, 1878), he does not attribute all the good effects of the cold bath to its power of reducing the temperature of the body. "It exercises," he says, "in the first instance, a remarkable sedative influence on the nervous system, and in the second place it diminishes the local pain and inflammation." The truth of this opinion is proven by the fact that the excitement, restlessness, and distress so frequently attendant upon fever frequently abate under the influence of the graduated bath long before any considerable reduction of temperature of the body can have taken place. To show that the temperature of the interior of the body is not immediately affected by the cold bath, Dr. Ord performed a number of experiments with a dead body. This was placed, first of all, in a bath at 110°, and then, by means of thermometers placed in different organs or muscles, the temperatures were read off. The water was then gradually cooled to 71°, but, although the body was allowed to remain in the water for three-quarters of an hour, no one of the thermometers indicated a fall in temperature of more than four degrees. The next day the experiment was repeated, and the water allowed to cool until its temperature sank to 50°, when of course a more decided effect was produced, but not so much so as we should have anticipated.

The paper also contains *An Analysis, and Remarks on, Sixty Cases of Enteric Fever treated in St. Thomas's Hospital in the autumn of 1877 and the winter of 1877-1878*. In these 60 cases there were eight deaths, or a mortality of 13.33 per cent. In 15 a relapse took place, and in several others a recrudescence of fever. In regard to relapses the author says that they are most apt to occur in cases characterized by constipation during the original attack or during convalescence, and appears inclined to attribute them to the irritation caused by hard masses of feces moving over a long series of fresh raw surfaces. He therefore considers that constipation may be a greater evil than a moderate amount of diarrhœa, and lays it down as a rule that in every case a movement should be obtained at least as often as once in three days. A moderate degree of diarrhœa he recommends us not to interfere with, but if the number of stools exceed three a day some means should be taken to check them; the author preferring for this purpose morphia suppositories or laudanum injections. Stimulants appear to have been given in very moderate quantities. The highest temperature observed in any of the cases was 106.8°. This was reached two days before death in a case which ended fatally by perforation, and was followed within a few hours by a fall to 97.6°. In this case the temperature was observed to be 103° one hour after death, or 1.4° higher than it was fifteen minutes after death.

In beginning his article *On Simple Meningitis*, Dr. W. S. GREENFIELD calls attention to the fact that many cases which were formerly recorded under the head of simple idiopathic meningitis we should probably now regard as due to tubercular or other disease. There still remains a certain number of cases not arising from local irritation, which we must continue to look upon as simple meningitis.

These, for the sake of convenience, he divides into two classes, one truly primary, the other arising as a complication or sequela of acute disease, or as the result of some blood contamination. The first of these classes is represented by the sporadic cases of cerebro-spinal meningitis occasionally met with in previously healthy adults, and the form which occurs rather more frequently in infancy without known cause. In the second class he places the cases of meningitis which occur in the course of, or as a sequel to, the acute specific fevers, acute pneumonia and rheumatism, acute blood-poisoning, such as pyæmia and septicæmia, or the more chronic blood changes in syphilis and Bright's disease. It is upon the latter class that the author dwells chiefly in this paper.

In regard to the relation of secondary meningitis to the pre-existing disease, the author says that it is a question on which great differences of opinion have existed. He does not think it can always be explained by referring it to the condition of the blood, although this is unquestionably the cause of it in many cases of rheumatism, gout, syphilis, Bright's disease, and pyæmia; for it often occurs in connection with a primary acute pleuro-pneumonia or other serous inflammation, for which no general blood condition can be invoked as a cause, neither can it be explained by the processes of metastasis or embolism. He thinks it therefore not improbable that the first inflammatory process may give rise to an altered condition of the blood which shall predispose to a similar secondary result. He sees in this extension of disease the illustration of a law which in his opinion governs many secondary morbid processes, and which may perhaps be styled that of homologous reactions. "To state it briefly, there is tendency of morbid reactions, whether inflammatory or other, which start in any particular kind of structure to affect other parts of similar structure in the same way, and also, that homologous organs or parts of organs tend to be affected secondarily to each other when diseased processes arise in them." He exemplifies this law by referring to cases of bone and joint diseases in which bones which are homologous but not symmetrical are affected together. A good example of this is found, he says, in rheumatoid arthritis, and sometimes in acute gout, which often affects the homologous joints of the hand and foot in a definite order which is the same in both. In the cases of bone and joint disease which he had observed, it has often been the upper limb of one side and the the lower of the opposite side which have been affected together. This homology of affection is seen in diseases of parts which correspond in structure or function, and in the fact that when any particular structure or tissue undergoes a morbid reaction, which has any tendency to become diffused or infective, those organs or tissues which are of the same kind are more liable to take on morbid reaction.

We have thus very briefly sketched the main points of this very suggestive and thoughtful paper, which will be found to be well worth a careful study, as will also the reports of cases, eleven in number, with which it concludes.

In some *Further Remarks on Kakke*, Mr. W. ANDERSON gives *An Account of the Pathology and Morbid Anatomy of the Disease*, thus completing the paper which appeared in the last volume of these Reports and which was noticed in the number of this Journal for January, 1878. It will be remembered that he there expressed the opinion that the principal lesion of the disease would be found to be seated in the brain and spinal cord. The autopsy of the case which he reports in this volume does not entirely sustain him in this opinion. The cerebral and spinal membranes were somewhat congested. On the outer surface of the dura mater in the cervical region were two blood extravasations of considerable extent. On microscopical examination of the brain and spinal cord "no changes were found in the nervous structures, but the capillary vessels were unusually distinct, though empty, and were collapsed in a very irregular manner,

as if after great distension." On the other hand, the mucous membrane of the stomach and bowels was found to be denuded of its epithelium, recalling the condition which is found in cholera. Indeed some of the symptoms observed in the case presented a striking resemblance to those of that disease.

*The Case of Croup* which Dr. W. S. GREENFIELD reports is chiefly interesting from the fact that it occurred in a child ten months old, and that the operation of tracheotomy which was performed for its relief was successful.

On the second day after the operation the nurse incautiously removed the tube. No bad consequences followed immediately upon this; the wound was nearly closed. At the end, however, of a week, the child's respiration became difficult, and signs of asphyxia began to show themselves. In fact after again opening the wound and introducing a dilator, it was necessary to have recourse to artificial respiration before the child revived. Upon examination of the wound it was found that the first opening had been a valvular one of V shape, and that the tongue thus formed had been pressed backwards into the trachea by the tube. After the removal of the tube there was no dyspnoea until the wound was nearly closed and the swollen subjacent tissues pressed upon the flaps, when the tongue was forced backwards into the trachea.

The tube was removed nine days after the operation, having been left in so long in order to insure complete adhesion of the tracheal flap to the tissues in front. On its removal the voice was natural and the breathing through the larynx easy. Nine months after the operation, the child was doing well and presented no symptoms of stricture of the trachea.

In his paper on *Treatment of Hydatid Disease of the Liver*, Dr. J. HARLEY collects and tabulates 96 cases of the disease, which have been reported, since the publication of his first paper in Volume XLIX. of the *Transactions of the Medico-Chirurgical Society*,<sup>1</sup> and finds in their histories additional confirmation of his opinion that the treatment, which he there maintained as the best is that which has furnished the greatest number of favourable results. It is well known that Dr. Murchison<sup>2</sup> prefers to puncture the hydatid cyst with a fine trocar, and that Dr. Fagge and Mr. Durham<sup>3</sup> have successfully treated the disease by electrolysis, but Dr. Harley says that time has shown that some of the cases reported by these gentlemen were really not cured, but only temporarily relieved, and that this must necessarily be the case with any plan of treatment which does not aim at the discharge of the parent cyst. Besides which, suppuration, followed by pyæmia, may occur in a cyst which had been treated in the manner recommended by Dr. Murchison. Dr. Harley, therefore, holds that a permanent opening should be maintained between the cyst and the air by means of a large canula, which should be replaced by a large elastic catheter as soon as it has been loosened by suppuration. In fact, as soon as possible two catheters should be introduced into the cyst, so that it may be thoroughly washed out by means of them. As an injection, the author prefers a weak solution of iodine.

Of 31 cases which were treated in this way, 18 radical cures are said to have taken place, and 9 deaths occurred. In 2 of the other cases the result was doubtful and in the remaining 2 the cysts discharged their contents through the lungs. As the author admits that some of the "radical cures" are not above criticism, and as 9 cases terminated fatally, we confess that the treatment appears to us to be scarcely justifiable until the means proposed by Dr. Murchison, and

<sup>1</sup> See notice in number of this Journal for July, 1867.

<sup>2</sup> Ibid., for January, 1869.

<sup>3</sup> Ibid., for July, 1872.

by Dr. Fagge and Mr. Durham have failed.<sup>1</sup> The paper is an interesting one, and its value is much increased by the tables which are appended to it.

Mr. J. F. PAYNE, in his article *On the Classification of Medicines, and especially of General Remedies*, alludes to the absolute necessity of some classification, and to the fact that none of those, as yet proposed, are entirely satisfactory. He divides remedies into, 1st. Those acting upon the body itself; and, 2d. Those acting only upon something in or upon the body. The first class is again to be divided into (a) General, or (b) Organic.

General remedies may be used either for their constitutional or for their local effect. In the first category he places, 1. Nutrients; 2. Tonics; 3. Alteratives. In the second, 1. Superficial stimulants and irritants; 2. Astringents and anti-phlogistics; 3. Destructives; 4. Superficial protectives; 5. Emollients and demulcents.

The *Medical Report* for 1876 shows that the total number of patients under treatment in the medical wards of St. Thomas's Hospital, during the year, were 1414, of whom 723 were men, and 691 women. The number of deaths was 256. The report for 1877 shows a slight decrease in the number of patients, the total number being 1371, of whom 747 were women and 624 men. 248 of the cases terminated fatally. These reports derive their chief value from the tables and abstracts of the more important cases which accompany them. J. H. H.

The first paper which belongs to the surgical portion of this volume is one relating *A Case of Intestinal Obstruction, with Remarks on Tapping the Intestine as a means of Cure in Certain Cases*. By W. W. WAGSTAFFE, Assistant Surgeon to the Hospital. The history of this case, though unfortunately lacking in pathological value from the absence of post-mortem results, is possessed of much clinical interest, owing to the long time over which it extends. About a year after an attack of typhoid fever, a young man twenty-five years old, had stoppage of the bowels with colic, which lasted two days. Similar attacks followed at short intervals, and after the fifth one the sufferer became a patient of Mr. Wagstaffe.

Upon examination a slightly movable, decidedly tender tumour, half the size of a hen's egg, could be made out in the right iliac fossa. Under the use of belladonna and a carefully regulated diet no further severe attacks occurred for five months. On May 19, 1875, however, a hearty meal was followed by vomiting, complete stoppage of the bowels, with bronzed skin, foul tongue, and delirium. On the 24th of May Mr. Wagstaffe saw him, and after resorting to the passage of a tube and the ordinary expedients, on the 26th a fine trocar was inserted between the umbilicus and ensiform cartilage, and much gas evacuated. On the next day it was found necessary to tap him again, and no less than four punctures were made before the necessary amount of wind was removed. Soon afterwards the bowels were freely moved, and despite a slight attack of peritonitis produced by great imprudence, the patient made a good recovery. A year later Mr. Wagstaffe was again sent for, but the attack which threatened succumbed to the use of belladonna. Some months afterwards, during the absence of Mr. Wagstaffe, the patient died, and no post-mortem was obtained, but the supposed cause of the fatal issue was an overdose of belladonna.

Mr. Wagstaffe thinks the case was one of contraction of a typhoid ulcer, with adhesions around the cæcum. Mr. Wagstaffe, from the experience of this case,

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<sup>1</sup> Of the 46 cases treated by simple puncture, reported by Dr. Murchison, only 3 proved fatal. The results of electrolysis are, as far as they go, still more favourable, for recovery took place in all the cases (8) so treated.

and others, one of which he narrated in the last number of the Reports of his Hospital, thinks that there are cases in which tympanitic distension may be a most urgent symptom, and that, whether acute or chronic, tapping with a fine trocar is attended with but little risk, is especially serviceable where the accumulation has taken place rapidly, and is sometimes a really curative measure. He further thinks that the mechanism can be explained as acting by the removal of pressure from above a valvular closure of the gut, rather than by the mere removal of gas from a temporarily paralyzed bowel. Mr. Wagstaffe refers to the paper of Dr. Fagge in *Guy's Hospital Reports*, vol. xiv., and thinks that the operation is worthy of more extensive trial than has hitherto been accorded to it.

The title of the next paper is one which will at once attract the eye of the student of forensic medicine, who will naturally think that *Notes on the Examinations of the Bodies of Fifty Children Born Dead or shortly Dying*, by ROBERT CORY, M.B., Cantab., Assistant Obstetric Physician to the Hospital, must contain a mass of material of very great value. Upon examination, however, we have found the paper disappointing, for while its first part is occupied with the description of certain pathological changes in the livers of syphilitic children, only its latter and smaller part is concerned with certain observations of the comparative weight of different viscera. Such comparisons as medico-legal tests are confessed to be unreliable; and to such a degree is this the case that they must ever be held under very grave suspicion in a court of law. In three cases with a syphilitic history, small white spots were scattered over the upper border of the right lobe of the liver, which upon section were seen to extend throughout the substance of the organ. Upon microscopical examination these spots were found to have an amorphous centre surrounded by small cells, which gradually increased in size as they approached the normal liver tissue. They were confined to the connecting tissue surrounding the portal veins. In two cases in addition to these small gummata, there were evidences of peritonitis present.

The medico-legal points of the paper are the evidence which can be adduced to prove the live birth of children from the position of the umbilicus, the comparative weight of the viscera, and the relation borne to the weight of the body and weight of the liver by lungs in which no respiration had taken place, where partial respiration had occurred, and where complete respiration had been accomplished.

These various points are summarized in separate tables, which are of value in enabling the medical expert to arrive at a great degree of probability, but do not establish a rule by which he is able, in any given case, to say this case was born alive or that one was born dead. Dr. Cory also found that of nine cases which were dropped from a height of eighteen inches upon a paved floor, in no less than eight were fractures in the course of the lines of ossification sustained. The observations of Dr. Cory have also led him to believe that there is a very constant relation existing between the size of the thymus gland and the development of the osseous centres.

Basing his study upon one hundred and five cases, which occurred in St. Thomas's Hospital within four years, Mr. WILLIAM MAC CORMAC contributes some *Observations on a Series of Dislocations of the Shoulder-joint*. The paper is quite elaborately thought out, but deals rather too much with mechanical details to admit of condensation. Of the entire number of cases, one hundred and four were downwards and forwards, and only one downwards and backwards.

Mr. Mac Cormac thinks that "the more carefully the nature of these dislocations and the method of their production are studied, the more evident it becomes that the most important factor in determining the position of the dislocated bone, and in opposing ill-considered attempts at reduction, is the capsule, and not the



scapular muscles." The case narrated by Sir Astley Cooper, in which one muscle after another was divided in a dead subject before reduction was accomplished, and where all attempts failed until the supra-spinatus was relaxed, is regarded by this author as furnishing conclusive proof that it was the unyielding capsule which was at fault rather than the one dead muscle. However this may be, Mr. MacCormac thinks that all cases can be reduced by manipulation, and in the steps of the process is careful to make such a series of motions as will successively relax the short, strong muscles which have their insertion near the head of the humerus. Mr. MacCormac is an earnest advocate for the use of manipulation as the mode of reduction, and very properly discards the use of pulleys, thinking that even in long-standing cases they can accomplish no more than will follow skilful manipulation. With this view few surgeons will differ, and in America none at all. When the writer of this notice was young in the profession, pulleys, Jarvis's adjuster, and other rude mechanical devices, were still occasionally resorted to by surgeons; but while their reign was over in America, and they bowed before the very superior means first methodized by Prof. H. H. Smith, for many years they continued to dominate over the minds of English surgeons whenever a dislocated shoulder presented itself. Now, however, the Yankee invention has made its way to England through the Continent of Europe, and we presume Mr. MacCormac speaks the sentiments of many of his confrères in advising the general resort to its aid.

In cases of too long standing to make attempts at reduction justifiable Mr. MacCormac following Billroth, recommends resection of the head of the bone wherever from pressure upon the nerve trunks the pain is unbearable. An interesting case where this plan was adopted is given.

Considerable space is given to a consideration of the very rare accident of a backward dislocation. Of this one case occurred in the series of hospital cases and one other is referred to as having been seen by the author in private practice.

As would naturally be expected this paper contains not much that is new, but presents a valuable study of the subject, and being founded upon the practice of the house finds a fitting place in a volume of hospital reports.

The next paper is by Mr. EDWARD NETTLESHIP, Ophthalmic Surgeon to the Hospital, on *Cases in Ophthalmic Practice with Notes and Observations*. The cases recorded are fourteen of syphilitic choroido-retinitis, ten of detachment of the retina, and disease of the vitreous, and six cases of abscess in the outlying lobules of the lachrymal gland, sometimes known as the "Inferior Lachrymal Gland." It is noticeable that in the second series of cases there was no evidence of the trouble having been produced by sexual exhaustion as suggested by Mr. Hutchinson in the *Ophthalmic Hospital Reports*, vol. ix.

A third series of *Anatomical Variations* is contributed by Mr. WAGSTAFFE and Dr. REID. There were but thirty-one bodies dissected, and a large number of unusual anatomical features were observed and are recorded in this paper. Much the larger number were of course found in the muscular system and possess but little interest out of the dissecting room. We notice one case of variety in vascular supply both rare and interesting, namely, one in which, in addition to a normal right bronchial artery, there was one supplied to the lung from the right internal mammary. In another case there were observed irregularities in the distribution of the thyroid arteries on one side.

*On a possible Source of fallacy in Measurement of the Lower Limbs*, by W. W. WAGSTAFFE, is the title of the next paper. Its author thinks that not nearly enough attention has been paid to the influence exerted upon measurement by tilting of the pelvis. It seems to us that this neglect is overstated; for certainly most teachers of surgery, in this country at least, do give most explicit, and gene-

rally accurate directions, as to the steps that must be taken to secure an exact result. No student who attended the practice of the Pennsylvania Hospital and witnessed the minute and painstaking care which was observed in the measurement of a case of broken thigh would ever be likely to pass the subject by as unimportant. Nor has there been less attention devoted to this matter in kindred institutions in the United States, as is well evidenced by the many articles which have been written and the sometimes acrimonious differences of opinion which have been entertained by practitioners of surgery on this side the sea. Here at least there has been a full appreciation of the importance of the position of the pelvis before a measurement of one of the lower limbs is attempted. To prove his point Mr. Wagstaffe instituted some experimental measurements, which as recorded in his paper show that when the pelvis is tilted upon that side the limb will measure about one inch more than its fellow. The same point is further illustrated by a diagram.

Some of the surgical cases which were included in the *Solly Medal Prize Essay* for 1878, by Mr. C. E. SHEPPARD, form a very interesting paper. This medal and prize was founded in commemoration of the late Samuel Solly, and this paper gives evidence of the good effects produced by the institution of a prize inviting competition. The cases while individually interesting have no connection with each other. They are a *subcutaneous venous angioma of the thigh* which was successfully removed by incision; a case of *lymphadenoma* which surrounded the anus, and extended up into the pelvis, which terminated fatally; a case of *concussion* which died; one of *compound fracture of the skull*, and one of *separation of lower epiphysis of femur*. As will be seen, at least three of these cases were very rare, and they are recorded in a most admirable manner, but the limits of this notice forbid any attempt at an analysis of them, and we can only commend them to the notice of our readers with the assurance that their interest will well repay for the perusal of the article.

The two remaining surgical articles are the *Surgical Reports* for 1876 and 1877, by CHARLES HENRY NEWBY, Surgical Registrar. 1745 cases were treated in 1876, and 1891 cases in 1877 on 220 surgical beds. The percentage of deaths in 1876 was 7.74, in 1877, 8.56. The Bavarian plaster dressing was largely used in fractures, and carron oil preserved its place in the treatment of burns. It is said that the attempt in 1876 to lower temperature by subcutaneous injections of carbolic acid failed, especially in cases of pyemia. Thomas's splint has been found invaluable in cases of injury or excision of the hip-joint, and Sayre's splint for spinal curvature has been recently adopted with much relief to the patients. Erysipelas prevailed extensively in 1877 despite every precaution, in the two wards which were nearest the infectious diseases wards, and the two wards where it was most commonly present were often overcrowded. One case of farcy occurred in 1876. The contagion was derived from contact with a glandered horse one month before admission. The patient had a scratch upon his hand at the time of his exposure, and succumbed to the disease 37 days after his admission into hospital. The majority of the pyæmic abscesses from which he suffered were superficial in their location.

These surgical Reports are most valuable statistical records, and the elaborate summaries which accompany the tables present a most instructive picture of the surgical practice of this great hospital. We can conceive of no better method of keeping hospital records, and it is one which our American institutions would do well to follow. If in the annual reports which are usually presented to their patrons by similar corporations in this country were contained such a summary of diseases and injury in classes, they would prove of much value to the profession, and much less inevitably find their way to the waste basket than they now do.

Appended to the Surgical Registrar's Report is an exceedingly brief table of ophthalmic cases by S. BERNAYS. These *Statistics of the Eye Department* include the practice of five years, and as they are all contained in one page are too condensed to be of any use, and are not calculated to elevate our ideas of the importance of a department in which during those years 11,479 cases were treated.

As a whole, most of the surgical papers are of value as presenting a history of the actual work done in Saint Thomas's Hospital, although they form the smaller part of this bulky volume. It is noticeable that but a small portion of the surgical staff are contributors. S. A.

ART. XXVI.—*The Principles and Practice of Surgery, being a Treatise on Surgical Diseases and Injuries.* By D. HAYES AGNEW, M.D., L.L.D., Professor of Surgery in the Medical Department of the University of Pennsylvania. In two volumes. Vol. I. Imp. 8vo. pp. x., 1062. Philadelphia: J. B. Lippincott & Co., 1878.

SINCE it became known that Professor Agnew of the University of Pennsylvania had in press a work upon Surgery, the profession of the country has been rather impatiently awaiting its appearance, and it is perhaps for this reason that the volume before us, the first part only of the promised work, has been issued at the present time. In a little over a thousand pages the author has treated of surgical diagnosis, inflammation, wounds, injuries of the head and chest, the diseases and injuries of the abdomen, bloodvessels, and osseous system. The limited time at our disposal will only permit of our noticing a few things that have attracted our attention in a rather hurried glance over the work.

The definition of inflammation ("hypernutrition carried on under such an extravagant plenum of supply that the germination and mutation of cell life are generally too hurried to mature, and are therefore unstable and short-lived"), accurate and concise as it may be, will we fancy prove somewhat confusing to many a student, who may have occasion to study the chapter upon this subject. Under the head of treatment, a good word is spoken for poultices, "applications of great value especially when the object is to favour suppuration, for which purpose nothing else can answer so well." Setons, issues, moxas, and the hot iron are pronounced "heroic remedies that have gone much out of fashion. . . . Now and then some one fond of lingering about the mausoleums of ancient medicine, and bringing to light their rude weapons of torture, attempts to revive and popularize their use; but I do not think I misrepresent professional sentiment in America by saying, save in exceptional cases of a chronic nature, let them rest in peace." Bloodletting is regarded favourably, though, as "it is a potent remedy," it should be used with the greatest judgment; and mercury is placed "among our most valuable resources. We have no remedy which so modifies or arrests inflammatory phenomena, or which so certainly insures the removal of inflammatory products, as this much-abused agent."

The origin of pus is declared "probably twofold; first and principally from the vessels, migrated leucocytes or white blood-corpuscles; and secondly from the stable connective tissue corpuscles, rendered again active by the inflammatory transudation." The germ-theory of suppuration is neither definitely accepted nor rejected. In answer to the question, "Are all the symptoms which follow the opening of a chronic abscess to be referred exclusively to the admission of air and septic matters?" it is stated, "I believe that they are not; I find them to follow the use of aspirators as certainly as when other means are resorted to." Again,

"some writers, such as Pasteur, believe that in the presence of these organisms consists the essence of decomposition or putrefaction." Again, "while much may be said both for and against this germ-theory, it is certainly true that in almost all cases of decomposition these low or simple organized bodies are recognized in great abundance." But upon the antiseptic treatment, based, as it really is, upon this germ-theory, Professor Agnew speaks more positively:—

"No harm can come of giving the patient the benefit of a doubt in using the antiseptic precautions of Mr. Lister . . . . When such agents are employed as prove destructive to their (the germs') existence the process of healing is greatly promoted. . . . . The antiseptic method of Prof. Lister for the treatment of wounds, I am convinced, after a trial of one year, possesses advantages over all others. While I have not obtained results so extraordinary as those claimed by this eminent surgeon, the success has been so much more satisfactory than that obtained by the ordinary plans, that to decline the use of antiseptic dressing would be, in my judgment, to withhold from a patient the benefit of one of the most important resources of the art. By this plan the suppuration is greatly lessened, the union hastened, the risk of constitutional infection diminished, and the surroundings of the patient rendered less prejudicial to health."

For the arrest of hemorrhage, "the direct or immediate application of a thread to a wounded vessel is" regarded as "on the whole the most satisfactory mode." Styptics are abhorred; torsion is not admitted to possess any superiority over the ligature; to acupressure there are certain objections, very serious ones too. Of the various kinds of ligatures, the carbolized catgut is pronounced "superior to all other forms, . . . . the only one which I employ, . . . . has never yet failed in my hands even when applied to vessels the size of the external iliac;" and the metallic is regarded as "certainly badly adapted to purposes of general ligation."

Of the method of healing of wounds by immediate union it is written, "It requires an imperial faith to believe that the gaping mouths of hundreds of capillaries, whose diameters do not exceed one three-thousandth of an inch, shall so abut that their canals will become continuous, that muscular fibre will meet its fellow, and all the other disjointed parts return to their former connection. To my mind it is simply impossible;" and further on it is declared that "nature follows but one method in the repair of wounds, and that is through cells and intercellular tissue and bloodvessels; in other words, through granulation-tissue, alike present whether the wound be small or great, open or subcutaneous."

In the chapter upon head injuries the author expresses his belief in the harmlessness of sutures used for closing scalp-wounds; attaches little value to Pott's "puffy tumour" as pathognomonic of internal abscess; knows of "no single remedy comparable to calomel in preventing meningitis, and encephalitis;" advises refraining entirely from operative interference in cases of fracture with depression, and fracture with depression and comminution, when the injury is not also compound; "cannot believe [in gunshot injuries] that the operation of cutting out a circular piece of bone from the skull is in itself serious, so long as the dura mater is not torn, any more so indeed than that of excising a portion of a rib and exposing the pleura costalis;" thinks it highly proper that pressure should be made upon that portion of a fungus cerebri "which spreads over the scalp beyond the limits of the opening in the bone;" and strongly urges "gentleness, deliberation, and patience" in making the operation of trephining so as to avoid even scratching the dura mater, a "desideratum of transcendent importance to the success of the operation."

In cases of neck wounds involving the internal or external carotid, it is declared to be "better to tie the primitive trunk; and the same course should be adopted in cases where the bleeding comes from even smaller branches, provided it is per-

sistent, and the vessel cannot be located, or can only be reached by a tedious division of structure." In view of the heavy mortality attending ligation of the common carotid, much exceeding that of the external, and the free and readily-established collateral circulation, we cannot but question the propriety of tying the main trunk rather than the vessel injured, or, if it cannot be readily found, the external carotid; and so far as cases of wound of the internal carotid are concerned the author himself states elsewhere, "in an open wound of the neck, and where the injury to the internal carotid is unmistakable, the ligature should of preference be applied to the damaged vessel, and upon both sides of the lesion."

The paragraph on gastrotomy was evidently written some time since, as no account has been taken of the operations made during the last two years or more, including the famous and successful case of Verneuil, in July, 1876. Many will, we doubt not, be disposed to take issue with the author in declaring that, "No amount of palliation can ever be set over against the subtraction of a single day from the life of a fellow-being."

In the description of left lumbar colotomy, it is stated that the colon will be found exactly on a line with a point *one inch* posterior to the middle of the crest of the ilium. Allingham says that it is *half* an inch, and his measurement has been generally accepted. Of Simon's rectal exploration, it is said, "the benefits resulting from such violence are of so doubtful a character, and the evils which have resulted are so serious, that I feel compelled to condemn the practice as rash and revolting." We have ourselves seen two deaths consequent upon such exploration. Excision of the rectum is pronounced an operation to be proposed "on the ground of palliation, not of cure," and justifiable only when the disease is epithelial, limited to the walls of the intestine, the peritoneum can be avoided, and the patient is in fair health.

Of the various operations for the radical cure of hernia, "not one," the author thinks, "can be said to be satisfactory; and it is a question admitting of grave doubt whether, in the present state of our knowledge on the subject, the surgeon is justifiable in resorting to any other treatment than that by a properly adjusted truss." In cases of strangulation, it is advised to employ taxis for "not more than ten minutes;" and it is very happily said that (though its derivative meaning is to put *in* order), "in the hands of unskilful men the taxis serves to put things very much *out* of order." Respecting the operating with or without opening the sac, we find that:

"In my own experience the Petit method has been so successful, that I never think of dividing the sac, except in cases where its contents cannot be restored, or where, in consequence of the long time that the hernia has been strangulated, there are strong reasons for believing that the parts are not in a condition to be returned into the abdomen. Those who oppose the practice do so on the ground that there must always be some uncertainty in the mind of the surgeon as to the state of the contents when the sac remains unopened. It is possible that an error may be committed on this point; but I apprehend that for every life lost from this cause, fifty are sacrificed by unnecessarily dividing the sac to inspect the intestine and the omentum."

At the conclusion of the paragraph on varix, it is stated that:

"According to my own observations in cases of varix operated on by myself with caustic, and in others which I know had been treated with the ligature, the disease has invariably returned. I do not, therefore, believe that any operation which has yet been devised for the radical cure of varices is entitled to professional confidence."

Of the various methods of treating aneurism, rest, the ligature, and compression are the only ones regarded with favour, save in exceptional cases. Manipulation "merits unqualified condemnation;" the method of injecting with any of our

present known coagulating agents "should be banished from surgical practice;" "the experiments of introducing solid substances into the sac have been made on the most hopeless forms of aneurism, but it is doubtful if their repetition will yield any more satisfactory results."

Chapter VIII. is devoted to the ligation of arteries, the directions for the various operations being clear, concise, and accurate, as might be expected from so excellent an anatomist as is the author. The illustrations are numerous, and many among them are familiar friends that have already done good service in the late Dr. John D. Jackson's translation of Farabeuf. Of tying the innominate artery, Prof. Agnew says that, "its claim to be accepted as a surgical procedure falls far short of that for the ligation of the abdominal aorta, and it should meet with the unqualified condemnation of the profession."

Three hundred pages are devoted to the consideration of injuries and diseases of the osseous system; over sixty, however, being taken up with tables of ununited fractures and the fractures treated at the Pennsylvania Hospital from January 1st, 1850, to January 1st, 1874. Valuable as these tables are, and capable of conveying much useful information to one who will carefully study them, we cannot but think that they are somewhat out of place in a work intended, in part at least, for the use of students as a college text-book. We are much pleased to notice that Prof. Agnew enters his protest against the acceptance of the doctrine, taught by some in our country, that shortening ought not to occur after fracture, and if it does occur that the treatment and consequently the surgeon is responsible therefor.

"A bone once broken, however simple the fracture, can rarely be repaired, even under the most skillful treatment, without some appreciable deformity or disability. . . . An examination of the various collections of fracture specimens will convince any one that under the most skillful management some degree of shortening will generally take place, nay, may be confidently expected. . . . I have not met with a single case among all the specimens of fracture of the shaft of the femur, which was entirely free from deformity; and I am equally certain that neither in hospital nor private practice, save in the case of children, have I ever succeeded in curing a case without an appreciable shortening. . . . In all cases of fracture of the femur, except in children, an appreciable degree of shortening may be expected. . . . The long line of distinguished men who have spoken on this subject, with few exceptions, from Hippocrates down utter but one voice, viz., that shortening is the rule. . . . I do not hesitate to say that a fracture in the shaft of the thigh-bone which is cured with one-half or three-quarters of an inch shortening is a good cure, and gives no room for complaint on the part of the patient; and that the surgeon who obtains this result may walk among his professional brethren without being conscious of the least inferiority or want of skill in the management of this class of surgical injury."

The practitioner is strongly urged to make an immediate examination of a fracture and early adjustment.

"To defer an immediate examination is to intensify the subsequent inflammation. In fact every important sign of fracture is rendered less pronounced by delay. The fact that the work of repair in a fracture does not begin until some days after the reception of the injury is no argument whatever for procrastination. . . . No advantage can result from delay, and therefore the sooner the work (of setting the fracture) is done, the better. Delay enhances the difficulties, and involves increased pain and suffering. The parts become swollen and sensitive—conditions which complicate the examination; the muscles offer greater resistance, and the inflammation is intensified by the force required in reduction."

Respecting the use of plaster of Paris, we read:—

"The period which I regard as the only proper one for the use of the plaster roller in the treatment of fractures is after the inflammatory swelling has subsided, and when the surgeon can calculate on the fixed dimensions of the part. If used

earlier than this, the limb will most probably in a few days lie loose in its case, the patient being thus exposed to the risk of an ununited fracture, or, if the swelling is on the increase, the dressing may, in consequence of its unyielding nature, jeopardize the vitality of the extremity by interfering with the circulation."

The Bavarian dressing is referred to in the paragraph on the treatment of fracture of the tibia, but no opinion of its relative value is expressed. In cases of fracture of the shaft of the femur, "the dressing by adhesive plaster, sand-bags, and extending weight, reduces the treatment of most fractures of the thigh to the simplest form, indeed so nearly approaches perfection that little else can be desired, and is equally well adapted to cases in which both thighs are broken." A combination of the inclined plane and extension by adhesive straps is regarded as a plan "preferable to all others" when the fracture is in the upper third.

The patella our author has found to be broken "most frequently by muscular action, when the limb was in a state of greater or less flexion." Hutchinson's view that the separation of the fragments is due to inter-articular effusion is pronounced untenable. Malgaigne's hook is declared an "infernal machine." Very close union is regarded as rather a disadvantage, because of the increased liability to re-fracture.

In cases of acute phlegmonous periostitis it is advised to remove the bone, if it dies, "at as early a period as possible, unless the patient labours under much febrile disturbance of the system, when it is better to delay operative interference until the circulation becomes more quiet." Is it not probable that while one is waiting for this quiet state the patient will become more and more exhausted, and so much the less able to endure any operation? In a case of our own, where, after three months' waiting, we removed the entire tibia from epiphysis to epiphysis, we will always believe that we waited at least one, if not two, months too long, in the vain hope that the constitutional disturbances would quiet down. In the concluding part of the article on necrosis, notice is made of the dental engine, pronounced "not only admirably suited for many operations on the bones, but the applications of which are almost unlimited."

In hurriedly looking through the book, as we have unfortunately been compelled to do, a few typographical errors have been noticed, *e. g.*, *urethra* for *ureter* in the sentence, "pain shooting down from the loins to the testicle, as in renal colic, indicates the presence of a stone in the urethra." One hundred instead of three hundred in the statement of the period before Christ when Erasistratus flourished; antiplastic, instead of anaplastic or autoplatic; 1520 the date assigned to Ambrose Paré must be a misprint, perhaps for 1580 or 1582, as this "representative man of that period" was born in 1517. The work is profusely illustrated, and well illustrated too, though a good many of the 897 engravings are old acquaintances. In conclusion, it only remains to say that our medical literature has much reason to be proud of this late addition to it, made by one learned and experienced; and we hope that we will not have to wait long for the appearance of the second volume, written as it will be *from* practice, not *for* practice.

P. S. C.

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ART. XXVII.—*Stricture of the Male Urethra, its Radical Cure.* By FESSENDEN N. OTIS, M.D., Professor of Genito-Urinary Diseases in the College of Physicians and Surgeons, New York, etc. etc. 8vo. pp. vii., 352. New York: G. P. Putnam's Sons, 1878.

THE author of the volume before us has distinguished himself among his fellows by his able discussion of genito-urinary questions. He is the master of a lucid

and often vigorous style. He possesses in an admirable degree the art of setting forth the truth in an original and striking form. His ingenuity has given to the profession a number of exceedingly valuable urethral instruments. With all this in his favour, and with the prestige of a deserved reputation, his latest contribution to the literature of his subject seems to us to be of limited worth.

The volume should be entitled: Dr. Otis's method of treating what he calls stricture; for in no sense can it be called a treatise upon the disease itself. It is made up largely of papers which have heretofore been made public; articles published originally in the *New York Medical Journal*, in 1870, 1872, 1873, and 1874; reports made to the New York State Medical Society; an Essay which first appeared in Dr. Seguin's valuable series of *American Clinical Lectures*; and a few minor reprints from the London *Lancet*. Observing a chronological order in the reproduction of these papers, the reader will find that no other order or system has been observed. He will look here in vain for chapters devoted in course to the symptoms, etiology, pathology, diagnosis, and treatment of the disease. As a consequence there is an iteration and reiteration of facts and arguments, and an over-sprinkling of many pages with *italic and capital letters*, which produce a general declamatory effect. Nor is this all. Frequent traversing of the same ground has involved an unnecessary reproduction of the same illustrations. Thus, for example, we find the same cut of the author's improved bulbous sound on pages 23, 53, and 136; of his small dilating urethrotome on pages 51 and 103; of his urethra-meter on pages 90, 136, and 77; and of the familiarly-old Henle-Cruveilhier section through the glans and fossa, on pages 76, 137, 161, and 177. The perusal of the work is thus rendered needlessly futile and tedious. It is like hearing an opera with the overture reported in every act and the tenor singing all of the parts.

Never more than to-day was the demand so imperative upon the book-maker for system, conciseness, and perspicuity. He is called on to prepare for his task with self-castigation, and to cultivate an Herodian pitilessness for the children of his brain.

Stripped of their five "retrospects" and of the "itinerary . . . with my family," the peculiar views of the author set forth in the book may be briefly summarized as follows: (a) The urinary meatus is not a trustworthy guide to the determination of the normal calibre of the urethra; (b) the urethra-meter of the author supplies such a guide to the normal urethral calibre; (c) all urethral resistances, to the passage of a bulbous sound whose dimensions correspond to the calibre as thus determined, constitute "strictures;" (d) all such "strictures" occasion gleet; and (e) the radical treatment of these conditions is the complete division of these resisting portions of the urethra, however numerous they may be.

But the normal male urethra, when undistended, is a long closed valve with walls in perfect apposition. Its so-called "calibre" is a mechanically produced space, varying in size, within certain limits, according as it is distended with urine or semen, and according to the degree of the *vis-à-tergo*. This latter varies with different individuals, and with the same individual at different periods of his life, and at different hours of the day. Surrounded as it is by muscular and elastic fibres, and lined with a sensitive membrane, the extent of distensibility of the urethra must ever be dependent upon conditions. No subjective symptoms can, therefore, accurately register the point where normal distension has been attained. Any procedure based upon the necessity of completely sundering every portion of the urethra where complete distension cannot be obtained, must occasionally prove disastrous.

Resting upon the propositions described above, we find certain doctrines more or less prominently supported, either by implication or formal statement, which



it is difficult to accept without reserve. Of these may be mentioned: (a) That a stricture originating in a damaged urethral patch, occupying at the outset only a portion of the circumference of the canal, results eventually and inevitably in a circular or annular coarctation involving the entire circumference; (b) that such damaged patches, limited at the outset in contour and depth, even though thus limited, invariably interfere with the current of urine to such an extent as to produce local irritation and thus extension of the pathological process; (c) that all strictures give rise to gleet, and that all gleets originate in stricture; (d) that gleet, even though it arise from the simpler forms of stricture, cannot be cured without dividing such stricture; (e) that internal urethrotomy is attended with so small a percentage of serious results, it is proper to resort to it even in the treatment of strictures of the greatest permeability and widest distensibility.

The arguments adverse to these propositions are presented with a great deal of candor, and are answered sometimes effectively, occasionally with an apparently unconscious evasion, often with a *petitio principii*.

Conservative surgery may well demand recognition in the treatment of genito-urinary diseases. Already, here and there in our journals, may be seen the protests of conservative writers against the unnecessary mutilations that are too commonly practised—meatotomy, for example, merely an aid to diagnosis. On the 41st and following pages of the volume before us, we find the record of a gentleman who, seeking relief for a urethral discharge, first had his meatus divided and subsequently was subjected to three different incisions of the urethra. After all this, notwithstanding the fact that there was an “entire absence of the purulent discharge,” the patient being able to attend to all his ordinary duties, and complaining of no symptom of which there is record, he endured four additional urethral incisions, apparently for no other reason than that the urethrometer revealed as many resisting surfaces.

The tables incorporated with the text are full and instructive; and will prove valuable for purposes of reference. Their value would have been greatly enhanced had a synoptical summary been added to each. We are much pleased to note that the author gauges all instruments by the French scale, which is founded on the metric system. The gradual adoption of this system by professional men in this country has been greatly accelerated during the last year by the united action of several associations, journals, and able writers, and it is encouraging to believe that it offers a means of securing uniformity also in the manufacture and mensuration of urethral sounds. The perforated scale-plates figured upon the frontispiece are, however, far inferior to the ingenious hand-made plate (devised by Handerson, of New York) whose long triangular aperture will register the size of any instrument for any scale desired—a method in practical use among the wire and pencil-lead makers.

Viewing the volume as a whole, we must conclude—and reluctantly in view of the author's brilliant reputation—that this is a book which includes much transient matter between its covers—a book that will scarcely stand the test of time. A great critic is ten years. It cannot be doubted that a conscientiously-wrought, systematic treatise upon the same subject from the same pen, would have achieved a gratifying success. As the matter stands, it yet remains for an American author in the future, to gather up all that is really good in these pages, and to incorporate it, after giving due credit to Dr. Otis, in some treatise with a larger scope and greater longevity prospects.

The literary blemishes and typographical errors that we note are too few to require comment. The cuts are creditably finished, and the well-known publishers have executed their task in really elegant form.

J. N. H.

ART. XXVIII.—*The Identification of the Human Skeleton. A Medico-Legal Study, to which was awarded the Prize of the Massachusetts Medical Society for 1878.* By THOMAS DWIGHT, M.D., of Boston, late Professor of Anatomy at the Medical School of Maine. 8vo. pp. 54. Boston: David Clapp & Son, Printers, 1878.

THIS timely contribution to the literature of legal medicine bears evidence of considerable research on the part of the author. It deals with a subject which, although of no special interest to the general practitioner of medicine, may at times assume a considerable importance, as when, in a trial for murder, it becomes necessary to produce the body of the alleged victim as the *corpus delicti*, and its identification must be established solely by the skeleton, or fragments thereof. From the time of Orfila the medical expert has been in possession of certain data or rules, given by different authorities to guide him in the identification of the dead from the inspection of the bones exclusively—for example, to determine the age, sex, stature, and sometimes even the probable cause of the violent death, as when marks are exhibited of a recent fracture of the skull; but all have been forced to acknowledge the inadequacy of these “rules.”

As the author informs us that his “researches apply solely to the skeleton, and to that of the adult Caucasian,” all references to articles of clothing or ornaments, and to all marks upon the skin, congenital or acquired—such as moles, naevi, cicatrices, tattoo-marks, etc., are excluded, and the observations are narrowed down to the inspection of the bones exclusively. But even with this limitation, one may occasionally glean important information as to the identity of the body by the discovery of some remembered deformity or peculiarity, such as curvature of the spine, club-foot, ankylosis, fracture, etc.

Several important points are discussed. First, Are the bones human? Of course, no difficulty can be presented under this head, provided the entire skeleton be discovered; but the case is widely different if only a few fragments are submitted for examination; and in such a case no person but one skilled in comparative anatomy should presume to give an opinion. Some ludicrous blunders on this subject are recorded in the books, where the bones of the lower animals as the ox, horse, dog and sheep have been mistaken for human bones, even by professional men. In such an investigation, a microscopic examination of the bony fragment might afford important aid, since it has been shown that the bone-cells differ in size in the four great classes of animals. They are smallest in birds, largest in reptiles, and intermediate in mammalia. In fishes they differ entirely in appearance from the others. As regards the identification of the *skull*, we may suppose that the only question that could possibly arise would be to distinguish between the human cranium and that of one of the higher apes. Here it may assist the inquirer to recall the fact that the latter, in common with the crania of most of the lower animals, contains two additional bones (not found in man) between the upper maxilla, termed intra-maxillaria, or incisoria; and that, although the sutures between these and the contiguous bones may become somewhat effaced by age, they are never completely obliterated. The question whether the simple inspection of the skull will enable us to determine the *race* to which the individual belonged, cannot, we think, be answered with sufficient accuracy to make it of much practical value in a medico-legal case. Of course, it is easy to distinguish between typical crania of the different races—for example, between the Caucasian and Negro; but then, as every one knows, even these often shade off so insensibly in their individual points, as to render it impossible to arrive at a definite conclusion from any single specimen.

The question, Do the discovered bones belong to one individual? cannot always be answered satisfactorily, since the mere finding them together does not afford positive proof, because it is possible that they might have been so placed purposely for deception; but here the knowledge of the anatomist will usually enable him to detect the attempted fraud.

The fact that the bones of the two sides of the body differ in their length is of more frequent occurrence than is generally supposed, and deserves consideration in this connection. The author quotes from 102 measurements tabulated by Dr. J. S. Wight, of Brooklyn, in which the legs were unequal in 79 cases, and equal in only 23 cases—the left leg being usually the longer. The inequality in 26 cases amounted to half an inch, or more. This fact may be of some practical importance in determining the amount of shortening after fracture of the femur. Dr. Dwight has himself ascertained that the two *clavicles* often differ in length. Thus, in 22 cases, he found only six pairs equal: “the remaining sixteen showed a difference of .39 inch; and four others a difference of over .19 inch. In only two cases was the right clavicle the longer.”

As regards a difference in the length of the *arms*, the author records the results of the examination of twelve skeletons as follows: in five cases the humeri were equal; in three, the left humerus was the longer; and in four, the right was the longer—the greatest difference being half an inch. The right radius was the longer four times, the difference never exceeding one-eighth of an inch. The two radii were equal in eight cases. In eleven skeletons he found the left femur the longer in four, and the right in two cases, the difference in one instance being .75 inch. Of the tibia, the right one was the longer four times, and the left six times. It is curious to notice that sometimes the longer femur and tibia are found on opposite sides.

To determine the question whether certain given *vertebræ* belong to the same skeleton is not usually attended with much difficulty, provided all the pieces are present, so as to be arranged *in situ*. But if several *vertebræ* are absent, the difficulty is much increased. To aid us in such cases, the author has prepared tables of the ascertained weights of the individual *vertebra*, by the use of which we may determine the question, at least approximately. Tables are likewise given of the heights of the bodies of the different *vertebræ*, together with the spread of their transverse processes—the variations in both cases being expressed by curved lines, as well as by figures. The author also lays proper stress on the anatomical marks by which the different *vertebræ* can be identified, especially the seventh cervical, the three lower dorsal, and the first and fifth lumbar, all of which possess certain recognized individual peculiarities.

It is not always possible to determine whether the *ribs* belong to a given spine; although it is generally easy to say whether these ribs belong together, by arranging them in their proper order, and noticing the regularity of their increase in length down to the seventh or eighth, and the steady recedence of the angle from the tubercle, as we go down.

As regards the *hand*, the author's observations confirm those of preceding authorities, in showing that, in the great majority of cases, the ring finger is longer than the index. The possibility of identifying the individual phalanges is also asserted, several characteristic marks being given, by which some of them, at least, can be recognized. In estimating the whole length of the hand from the bones, we should not forget to add about five-eighths of an inch for the soft parts intervening between the different joints. The possibility of determining the length of the hand from a single phalanx (the first of the middle finger) has been asserted by M. de St. Luca (*Cosmos*, Oct. 2, 1863, quoted by Dr. Taylor), who states that this phalanx is equal to one-fourth the whole length of the hand.

including the carpus; and further, since the hand measures one-fifth the length of the arm, and the length of the two arms added to that of the two clavicles, together with the breadth of the sternum, is equal to the whole height of the body, we may determine the stature of the skeleton by simply measuring the first phalanx of the middle finger. We must believe this statement of M. de St. Luca to be only approximately correct, inasmuch as the length of the hands, and especially that of the fingers, varies so materially in different persons of the same height. In making such an estimate, it will be found that so trifling a variation in the length of the first middle phalanx as the one-sixteenth of an inch would, according to this method of calculation, make as great a difference in the total result as two and a half inches.

In estimating the true length of the *foot* from the bones, the author's recommendation to add one and five-eighth inches for the loss of the soft parts, is experimentally correct.

The question of *sex* can usually be determined from the entire skeleton without difficulty by the inspection of the pelvis, to which the author very properly assigns the first importance as a means of distinction. We need not here advert to the well-known points of difference between the male and female pelvis, as they are so minutely described by the anatomist and obstetrician. Other points in this comparison to be noticed, although of inferior importance, are the differences in the skull, thorax, sternum, clavicle, femur and sacrum. We may observe, in passing, that the author ascribes little importance to the shape and size of the thyroid foramina as a means of diagnosis. Dr. John Neill, of this city, has given us the results of thirty-two examinations made by him to determine this point, which go to show that the foramen in the male is oval, while in the female it is triangular; also, that it is largest in the male. (*Trans. of Coll. of Phys. Phila.*, vol. iii., No. 2.)

The question of *age* is more difficult to decide from the skeleton than that of sex. Indeed, in the majority of cases, on account of individual variations, we cannot expect to arrive at a positive conclusion on this point. The teeth, of course, in the order of their appearance (which is tolerably uniform) will afford material aid up to adult age. Apart from the teeth, regard must be had chiefly to the union of the various epiphyses, the obliteration of the cranial sutures, the joining together of distinct pieces of bones—such as the sternum and coccyx, the absorption of the alveolar processes of the lower jaw, and the widening of its angle. Thus, "if the epiphyses of all the long bones are firmly united, it is safe to consider the age to have been at least twenty-four in the male, and twenty-two in the female; whilst, if the union be imperfect, the presumption would be that the age was not over twenty, almost certainly not in the female." If the bones of the sternum and of the os coccygis are perfectly united, it would be safe to infer, according to good anatomical authorities, that the age is from fifty to sixty years. It is scarcely necessary to remark that very old bones become lighter and more brittle, and the flat bones considerably thinner, from the absorption of the diploë.

As regards the skeleton of a new-born child, probably the most reliable criterion of its age is afforded by the degree of ossification of the lower cartilaginous epiphysis of the femur, as first pointed out by Beclard. If the osseous deposit be wanting altogether, the age has not advanced beyond the eighth month of fetal life; while, if the bony islet measures two or three lines, we may be certain that the child has attained to full term.

As to the question of *stature*, we quite agree with the author that the so-termed "rules of proportion" of the human body are not reliable guides. The safer plan, if the skeleton is entire, is to arrange the bones *in situ*, and then measure

the height, making proper allowances for the soft parts. But even here, absolute accuracy cannot be attained, chiefly on account of the variations in the curve of the spinal column in different individuals. As the result of numerous measurements, both his own and others', the author assumes the total height of the intervertebral cartilages to be 25.6 per cent. of the entire length of the spine. In order to obtain as correct a measurement of the spine as possible, the author describes the method of Prof. Meyer, of Zurich, which seems worthy of general acceptance, although somewhat complicated; so likewise, as to the proper method of placing the spine upon the pelvis, Meyer's rule is "to bring the anterior superior spines of the ilia and the spines of the pubes into the same vertical plane;" this the author slightly modifies by "bringing the iliac spines even a little further forward."

As a collateral aid in estimating the stature, we may also have regard to the generally accepted rule that the top of the symphysis of the pubes is about the centre of the body; although, from a considerable number of measurements made by Quain, Sappey, Quetelet, Gould, and others, the conclusion is that in average men the centre is a little below the symphysis, whilst in average women it is at the symphysis.

If certain parts of the skeleton should be missing, the deficiency must be supplied from the average size of the lost part. In the case of the head, the deficiency (from numerous estimates) is "practically for the male, five and a half inches, and for the female, a trifle under five, together with the height of the front of the arch of the atlas, and an additional quarter of an inch for the scalp." Another valuable rule in case of loss of the head is that of Dr. Gould: "to find the height of the spine of the seventh cervical vertebra from the ground, and add to this 9.95 inches, which is the average height from this point to the top of the head." In case of loss of the pelvis and lower limbs, no very definite rule can be given.

In a trial for murder it may sometimes be important to determine the time that has elapsed since the death of the victim. Unfortunately, this question can hardly ever be satisfactorily answered by the expert, since so many circumstances have to be considered, such as the prevailing temperature, the degree of exposure of the body, the nature of the soil in which it was buried, the dryness or humidity of the atmosphere, etc., all of which materially influence the result, and ought to produce a becoming reserve on the part of the witness.

From the above somewhat extended examination of Dr. Dwight's brochure, we feel very favourably impressed with the results of his investigations, which have evidently been carefully and conscientiously conducted; and we welcome his book as a valuable addition to our stock of medico-legal knowledge.

J. J. R.

ART. XXIX.—*Clinical Lectures on Stricture of the Urethra, and other Disorders of the Urinary Organs.* By REGINALD HARRISON, F.R.C.S., Surgeon to the Liverpool Royal Infirmary, formerly Lecturer on Surgery at the School of Medicine, and Surgeon to the Liverpool Northern Hospital. 8vo. pp. xi., 193. London: J. & A. Churchill, 1878.

THE name of Mr. Harrison was made familiar to some American readers about ten years ago as one of the editors of the *Liverpool Medical and Surgical Reports*, which, though more deserving than some of its competitors among the

army of annuals which then sprang into existence, was perhaps as short-lived as any of the number.

In this modest volume of Lectures, Mr. Harrison again appears in the world of letters, and by the simplicity of his style, the practical good sense displayed, and the value necessarily attached to decisions based, as they are, upon a large experience, is entitled to a respectful hearing, and, in our opinion, to the confidence of all who may consult his pages for information.

The man who, in this period of the world's history, essays to write upon so important and thoroughly investigated a subject as disorders of the genito-urinary apparatus, cannot expect to bring forward many things which will be essentially new, but must content himself, in large measure, with pronouncing upon the suggestions of others. During the last twenty years we have passed through an era of discovery and advance, and in the attempt to aid the cause of progress, many suggestions, good, bad, and indifferent, have been made. We now seem to have reached a position in which good service can be done for the cause of surgical science by pausing, and submitting to a critical analysis the practical value of the many suggestions made, and by testing, in the light of experience, the right which some modern methods have to continued existence.

It is from this standpoint that the work of Mr. Harrison is seen to be important, and it is eminently fitting that one whose opportunities, as surgeon to an infirmary in the greatest seaport of the globe, have enabled him to apply these crucial tests, should pronounce his opinion as to the value of the methods he has tested, and his judgment must be considered as carrying much weight.

Mr. Harrison restricts the term stricture to those cases in which organic narrowing of the canal exists, regarding those in which the stoppage is produced either by "spasm" or inflammation as too transitory in their character to take their place with them. In thus restricting his definition he is in accord with one whom all must look upon as a leader in this branch of surgery, namely, Sir Henry Thompson.

Mr. Harrison thinks that it is a mistake to say that a stricture has been produced by a gleet, as is so commonly done, inasmuch as he maintains that a gleet is indicative of a stricture already existing in its first stage. In this position he will have the endorsement of many careful surgeons, who have been taught by experience that among the best methods of treating a gleet is to introduce a full-sized bougie, and who have found in so doing that there is almost always an appreciable amount of constriction present. In this connection the causative influence of injections is discussed, and it is well shown that the balsams act locally as well as do injections, and that to neither can a stricture be justly ascribed unless their action has been so active as to constitute them irritants of the urethra. Mr. Harrison is much opposed to large injections for the treatment of gonorrhœa, favouring the frequent repetition of small ones, and holds that, if not too potent, no harm can follow their use.

The classification of strictures adopted by our author is—

"First. Free (inside the canal), including warts, valves, and bridles.

"Second. In the walls, including traumatic and ulcer cicatrices.

"Third. Outside and around the mucous membrane, including peri-urethral callus, as ring stricture (short), nodular stricture, diffuse stricture."

Passing over the second lecture, which is occupied with the very important anatomical details, without an accurate knowledge of which no one should venture to concern himself with the surgery of the urethra, in lecture third we come to the symptoms of stricture, which are divided into those which are indicative of the inflammatory stage, and those which are derived from the obstruction of the lumen of the urethra. Mr. Harrison strenuously maintains the orthodox position

that a stricture does not tend to recovery, and in this lecture he details briefly, but clearly, the progressive changes which the gradual contraction of the stricture produces upon the whole genito-urinary tract.

One case is related which occurred under Mr. Harrison's notice, in which the bladder was ruptured by the effort to overcome the obstruction presented by a stricture, and fatal effusion of urine into the peritoneal cavity followed. Attention is also called to the severity of the symptoms which sometimes follow operations upon the urethra, and one or two instances are given in which death resulted from the introduction of a catheter.

The fourth lecture is devoted to treatment. Mr. Harrison lays great and deserved stress upon the importance of gentleness in the use of the catheter, and recommends that it should be introduced when the patient is lying down. Mr. Harrison himself prefers the short-curved instruments of Syme, but thinks it wise for the practitioner to confine himself to one form of instrument, as, like the man of one book, he will best become dexterous in the introduction of instruments into the bladder if they always have the same form. He does not like bulbous-headed sounds for exploring the urethra, but prefers them for the dilatation of a stricture. The neck of such sounds should be very flexible, so as to be self-guiding. Following the example of the late Mr. Wormald, of St. Bartholomew's Hospital, castor oil is recommended for the lubrication of bougies as preferable to olive oil. The dilatation should be very gradual, four or five days intervening between the sittings; but the dilatation should be carried to an extreme by the passage of an instrument somewhat larger in size than the urethra when undistended. The method of continuous dilatation, by allowing a bougie to remain in the canal for from forty-eight to seventy-two hours, is endorsed as possessing much merit, and as especially valuable in those cases where there is much intolerance of catheterism. While the bougie is thus allowed to remain, it is of great importance that the temperature should be carefully watched, and should a sudden rise of the mercury take place, the bougie should be immediately withdrawn from the urethra.

In his fifth lecture, Mr. Harrison treats of the accidents which may occur during the treatment of a stricture, namely, Urethral Fever, Suppression of Urine, Hemorrhage from the Urethra, and False Passages; while Retention of Urine, Catheterism, Impassable Stricture, Aspiration of the Bladder, Tapping, Cock's Operation, and Forcible Catheterism are discussed in the sixth lecture. Aspiration receives a hearty endorsement from our author wherever the bladder cannot be reached in the natural way, as not only affording the desired relief, but as making the after-treatment of the stricture much easier. Where the destruction of the urethra is so complete as to afford but little hope of its ultimate restoration, Mr. Harrison has had very good results from the operation of tapping the urethra at the apex of the prostate gland, as devised by Mr. Cock. The attempt to force a stricture is emphatically condemned as unscientific, and well adapted to do much injury; at the same time he condemns the practice of converting Cock's operation into a perineal section, advising that the direct division of the stricture be left until a later date.

The seventh lecture is very interesting. It treats of external section of strictures, and discusses the various operations which have been devised and practised with this end in view. The peculiar operation invented by Mr. Wheelhouse, of Leeds, is much praised, and the paper of that gentleman in the *British Medical Journal* of June 24, 1876, is quoted *in extenso*. This method consists in making an opening into the urethra a quarter of an inch in front of the stricture. The edges of the divided canal are then held apart, by appropriate forceps, and a hook on the end of the director upon which the incision has been made. The

operator is then enabled to look at the seat of stricture, and can try to insert a fine probe through it, and, when this is once accomplished, the constriction can be accurately divided in the line of the canal. Mr. Harrison has had some success with this ingenious method.

The eighth lecture treats of strictures complicated with, or caused by syphilis; while the ninth is devoted to a discussion of some of the consequences of strictures. In his tenth lecture, which is occupied with rupture of the urethra, Mr. Harrison says that perineal section is the safest course to adopt, for the following reasons:—

“1. Because of the impossibility of accurately determining the extent and direction of the laceration.

“2. Because incision is the surest means of preventing extravasation of urine.

“3. Because incision diminishes the risk of a stricture forming; or, at all events, moderates the severity of such a formation.”

Internal urethrotomy is treated of in the eleventh lecture. This operation, Mr. Harrison holds, should be restricted to those cases which experience has proved, by direct and patient trial, do not bear dilatation well. He does not approve of Dr. Otis's proposition to make it a standard operation for all cases, even in the early stages of the formation of a stricture. This disapproval is fortified by the results of the treatment in the hands of Mr. Berkeley Hill and himself. The advice will be looked upon as sound by all those who do not make use of a cutting operation so long as it can be avoided. In those cases where an internal division of the stricture is rendered necessary by its persistent tendency to contract when simply dilated by bougies, Mr. Harrison uses an instrument of his own devising, by which two limited incisions are made at the same time in the roof and in the floor of the urethra. After using this instrument, which is pictured in his book, he employs oval-shaped bougies, the effect of which is to dilate the stricture laterally, and thus separate the lips of the incisions. Mr. Harrison has employed the immediate method of Mr. Holt in about seventy cases with very good average results. He thinks it is peculiarly suited for those cases in which it is apparent that the stricture is entirely submucous—in those cases where the stricture is short, and in those in which several strictures exist with false passages—and he is not prepared to admit that it should be entirely superseded by internal urethrotomy, although such improvements have lately been made in this latter method.

We have now followed our author through the eleven lectures which treat more directly of the urethra. The remaining seven comprised in the volume are occupied with Foreign Bodies in the Bladder—Hypertrophy of the Prostate—Cystitis—Calculous Disorders and their Treatment—Tumors and Diseases of the Bladder. So much space has already been consumed that we are compelled to pass them by with the bare mention. Whoever consults the volume itself will find that these latter lectures present the same features as those which have passed before us cursorily in review. They bear the imprint of being the results of personal experience, as do the others, and contain many hints as to minute details—hints which are so often more valuable to the perplexed surgeon than the elaborate statements of a more systematic work.

Appended to the book is a leaflet, reprinted from the *Lancet*, containing an account of an ingenious instrument, invented by Mr. Harrison, to insert medicated pessaries or suppositories into the bladder.

In conclusion, it remains but for us to reiterate the opinion already expressed, that this modest book is a valuable contribution to surgical knowledge, and entitled to the highest confidence of the profession.

S. A.



ART. XXX.—*Contributions to the Physiology and Pathology of the Breast and its Lymphatic Glands.* By CHARLES CREIGHTON, M. B., Demonstrator of Anatomy in the University of Cambridge. 8vo. pp. 200. London: Mac-Millan & Co., 1878.

IN this volume, which is a revised reprint of several papers which were published under the auspices of the Medical Department of the Privy Council and in the *Journal of Anatomy and Physiology*, Dr. Creighton, who appears to be a painstaking, conscientious, and original investigator, sets forth most novel and heterodox views in regard to the development of the mammary gland and the pathological processes concerned in the histogenesis of neoplasms, which, if they should prove to be true, will upset our present ideas as to the morphological attributes of the blastodermic layers and the elements from which tumours are derived.

In the first part of the work, which is strictly physiological, the author shows that during the early periodical evolution of the breast, the secreting epithelium proliferates after the manner of endogenous cell-formation or vacuolation, and that large granular cells containing yellow pigment, which represent waste products, result, which leave the acini bodily to infiltrate the interacinous and interlobular connective tissue, whence they enter the lymphatics and are transported to the associated lymphatic glands to be converted into lymph-cells. During the last stages of evolution, as the epithelium is returning to its quiescent state, typical vacuolation of the epithelium is going on with the formation of mucus, until finally the state of involution is reached, when the epithelium resumes its polyhedral form.

In opposition to the generally accepted opinion that the development of the breast is due to the infolding or extension downwards of the ectoderm, epiblast, or outer layer of the embryo, Dr. Creighton concludes, from investigations conducted upon the kitten and Guinea-pig, the steps of which inquiry we need not follow, that the glandular elements, or acini, are developed from the embryonic cells that give rise to the connective tissue framework of the gland; in other words that they originate from the mesoblast or hæmoblast. This view, which is so utterly at variance with that of Remak, His, and other observers, it need scarcely be said, must be received with caution.

The second part of the work is devoted to the consideration of the pathological processes of the breast, as exemplified by the mode of origin of various morbid growths, and is based upon the study of twenty cases of mammary tumours in the bitch, two in the cat, and eight in the human female breast. As a result of functional irregularities, there is a kind of spurious evolution from the resting state, as is indicated by the production of large granular pigmented cells, as occurs in the physiological unfolding of the gland. These waste epithelial products, by their accumulation either in the acini or the periacinous connective tissue, give rise to tumours. If they distend the acini, encephaloid cancer results; if, on the other hand, they infiltrate the surrounding tissue, scirrhus cancer is produced. Coming still nearer to the full excitation, and parallel with the mucous changes in the vacuolated cells, myxoma is developed; while the highest scale of excitation is marked by the formation of enchondroma.

Not only does Dr. Creighton derive the above-mentioned neoplasms from the waste products which result from the vacuolation of the epithelial cells of the acini, but he regards the small-celled infiltration of the periacinous connective tissue as consisting of the same waste cells, in opposition to the view that it is due to wandering cells or leucocytes. He, moreover, maintains that the pigmented cells which have escaped bodily from the acini into the surrounding tissue may assume an

oblong or spindle shape, and that the cells of sarcoma merely represent a morbid type of epithelium.

With regard to secondary infection of the lymphatic glands, the author teaches that the pigmented cells are transported to the lymphatic glands, where they either act as foci of the new growth, or by contact, that is by the so-called spermatie influence, infect the lymph-cells and convert them into tumour elements.

We have thus, in the space allotted to us, endeavoured to give a synopsis of the peculiar views of the author, and must refer our readers for more minute details to the work itself, which is deserving of the most attentive and thoughtful perusal.

S. W. G.

ART. XXXI.—*Recent Works on Operative Surgery.*

1. *A Manual of Operative Surgery.* By LEWIS A. STIMSON, B.A. (Yale), M.D., etc., Surgeon to the Presbyterian Hospital, etc. 12mo. pp. 477. Philadelphia: Henry C. Lea, 1878.
2. *Practical Surgery: including Surgical Dressings, Bandaging, Ligations, and Amputations.* By J. EWING MEARS, M.D., Demonstrator of Surgery in Jefferson Medical College, etc. 12mo. pp. 279. Philadelphia: Lindsay & Blakiston, 1878.

1. To prepare a manual of operative surgery "sufficiently complete, as regards both the number of operations described, and the details of the descriptions, to meet the wants of the practitioner and of the student," that in length shall not exceed 450 duodecimo pages of large type, including over 300 engravings of various sizes, is certainly no easy task; indeed it is very questionable if it can be done.

The book before us is a very fair attempt at fulfilling the requirements, and has pleased us better the more we have examined it. It includes chapters on the *accessories of an operation, ligations, amputations, excisions, neurotomy and tenotomy, plastic operations*, and the *special operations* upon the various parts of the body. The selection of operations is, in the main, judicious, and the descriptions generally clear and yet concise. Had the author had a large personal experience in the making of the various operations described for the relief of particular diseases, injuries, or malformations, and consequently been better able, knowing their several advantages and disadvantages, to give their relative value, the usefulness of the book to both practitioners and students would certainly have been much increased. A work on operative surgery should, in our judgment, be the last ripe fruit of a long and active surgical career.

Let us briefly notice some of the views and statements of the author.

In writing of the Esmarch bandage, it is declared that after the cut vessels have been tied, "the oozing arrested with ice-water, and the wound closed, no bleeding need then be feared." Unfortunately, every once in a while, bleeding does occur, and in the fact that such may take place lies a very serious objection to the use of the bandage, so serious that some of our best surgeons have because of it abandoned the "bloodless method" in certain cases of excision, particularly of the knee-joint. It might have been well to have noticed in this connection the use of hot water and the galvanic current as hæmostatics.

Should one have occasion to ligate the abdominal aorta, he is advised to operate in the original way, going straight down in the median line through the two layers of the peritoneum. In treating of ligature of the femoral artery, Hunter's canal is said to be "the condensed sheath for a short distance above and below the

point where the artery passes through the adductor magnus." By English and American anatomists (the most of them certainly) the canal of the adductor is not called Hunter's, such name being applied to the long triangular interspace between the vastus internus and the adductor, extending from the apex of Scarpa's triangle to the opening in the adductor magnus.

Referring to cerebral localizations as aids to trephining, there is expressed, we believe, the general sentiment of the surgical world, when it is said that "the weight of authority is decidedly against any interference based solely upon such theoretical considerations." The line of the fissure of Rolando is very conveniently described as that of "the hypotenuse of a right-angled triangle, whose base is the upper half of a line drawn from the bregma to the meatus auditorius externus, and whose perpendicular extends two inches backwards from the bregma along the median line."

*External perineal urethrotomy without a guide*, it is said, "is not often required;" as "the cases are very rare in which a filiform whalebone bougie cannot be passed through a stricture which allows urine to pass." True as this is theoretically, practically for physicians in general it is not quite so true, and a very tight stricture is to the majority of those not specially skilled in urethral manipulations an impermeable stricture; and they must either make external urethrotomy without a guide, tap the bladder, get help, or let the patient die. With reference to tapping the bladder, it seems to us rather surprising that while the supra-pubic, sub-pubic, and rectal operations are described, not a word is said about aspiration, the quickest, safest, and by far the least dangerous of all methods of emptying an over-distended bladder when a catheter cannot be introduced. A page and more is devoted to the description of the McBurney operation for rectal puncture, an operation that can only be made when the urethra will permit of the passing through it of a fair-sized catheter, and intended, we presume, for cases in which it is desired to keep the bladder empty.

In treating of *supra-pubic lithotomy*, it is stated that "the danger of infiltration of urine must be met by drainage of the bladder. The usual method is to introduce a soft-rubber catheter through the urethra, but this often proves very irritating, and Dr. Keyes prefers to drain through the rectum." Dulles, who has recently and so carefully investigated this subject, says: "The urine should be drawn off from the bladder at short intervals, until the wound is consolidated. A catheter should by no means be left in the urethra. . . . The dangers of urinary infiltration and peritonitis" are "greatly overrated." In this connection we might inquire how often Dr. Keyes has made *supra-pubic* lithotomy, and upon how much experience he bases his preference for one method of draining rather than another. We do not remember to have seen any reports of such operations made by him. Dr. Stimson says, "No sutures should be placed in the bladder;" Dr. Dulles that "sewing up the bladder is of decided advantage. . . . The most brilliant results have been secured by carefully closing the wound in the bladder with sutures."

We are surprised to notice that nothing is said of the operations made for the relief of anal fissure and of fistula in ano; operations of much more importance to the student and general practitioner than that of Michel for division of the inferior dental nerve, or of Wood for the radical cure of hernia. We are also a little surprised that no reference is made to Carnochan's operation upon the second branch of the fifth nerve, especially when we read that "*Dolbeau* divided the nerve with curved scissors on the central side of the branches going to the sphenopalatine ganglion, and tore out the ganglion by drawing upon the nerve." If there is any special advantage in the removal of the nerve back to the foramen rotundum (which our investigations lead us to believe there is not) the credit of originating the operation belongs to Carnochan.

2. An excellent unpretentious little book on *dressings, bandaging, ligations, and amputations*, for which students will certainly be thankful to Doctor Mears. The anatomical relations of the parts involved are well though briefly stated, the landmarks are clearly pointed out, and the various steps of the operations are so given that they can readily be understood and followed. Perhaps a somewhat more detailed account of the necessary operative procedures in some of the ligations and amputations might have advantageously been given.

In describing the course of the facial artery, it is said to pass through the submaxillary gland. Generally it simply grooves the upper surface of the gland.

No mention is made of the incision below and parallel to Poupart's ligament in ligation of the common femoral, an incision that we think is preferable to the one described.

The incision for reaching the popliteal in its lower third is directed to be made in the median line. If a little to the outside of that line it will be more exactly over the interspace between the two heads of the gastrocnemius.

It would have been well, in describing the operation for ligaturing the posterior tibial by cutting through the tibial origin of the soleus, to have spoken of the existence of the fibrous septum of that muscle, which is not infrequently mistaken for the inter-muscular fascia.

In detailing the steps of the Chopart amputation, the student should have been warned against the danger of carrying the knife too far in the line of the curve between the astragalus and scaphoid, with the result, of course, of getting into the space between the astragalus and os calcis and striking against the latter bone. We have seen this so often done by students that we are sorry that Dr. Mears did not refer to it.

In amputation at the shoulder-joint it is, as usual, stated that the subclavian artery is to be compressed against the first rib. The hemorrhage, as we know, can be easily and thoroughly controlled by carrying the narrow Esmarch band or cord around the axilla close to the body.

The illustrations in the book are numerous, and most of them fully as good as might reasonably have been expected.

P. S. C.

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ART. XXXII.—*Harvey and his Discovery*. By J. M. DA COSTA, M.D., Professor of the Practice of Medicine at the Jefferson Medical College, Philadelphia. 8vo. pp. 57. Philadelphia: J. B. Lippincott & Co. 1879.

THE recent occurrence of the tercentenary of the birth of Harvey has been the fruitful occasion of many disquisitions upon the discovery of the circulation of the blood.

The story of Harvey's life and labors is always full of interest to the student of medical history, and in the little volume which heads this notice "the old, old story" is told in the best style of its accomplished author. It consists of an address delivered at the opening of the present session of Jefferson Medical College by Dr. Da Costa, and with the addition of some illustrative notes is now offered to the public in its present neat and attractive form.

Any presentation of Harvey's claims possesses more than ordinary interest now on account of the numerous impeachments of his title which have been recently published. Quite recently we have seen the erection of a memorial tablet to Carlo Ruini, and monuments to Andrea Cesalpino and Harvey, each proclaiming its honoured dead to be the discoverer of the great truth. Servetus, the erra-

tic Spaniard, whose "figure stands out in history as one of the most striking of the sixteenth century," has again found an able advocate in Henri Tollin, of Magdeburg. These are all, however, revivals of the same claims of which Haller long ago said: "Others at length, that could not withstand their own eyes, and the just sentence of all Europe in its favour, were invidiously for depriving our British Hippocrates of the honours due to so great discoveries, by fishing them out from the dark waters of his predecessors." (An Historical Introduction, etc., Physiology, vol. i.)

Dr. Da Costa uncompromisingly rejects all these claims, and accords to Harvey's genius all the glory which clusters about a discovery "without which there could be no such thing as scientific medicine." The address is naturally divided into two parts; in the first of which is briefly sketched the private and professional life of the *man* Harvey, while the second part treats more particularly of Harvey the *discoverer*.

Into both divisions, but especially the first, we have pleasantly interwoven much interesting information concerning the times and contemporaries of the illustrious Harvey.

In studying the life of Harvey we have always found the account of his conduct at Edgehill a heavy tax on our credulity. It is related upon the authority of the tattling Aubrey that during the progress of the battle he withdrew with the sons of King Charles, under a hedge, "and tooke out of his pockett a booke and read. But he had not read very long before a bullet of a great gun grazed on the ground neare him, which made him remove his station." While there are many things that lead us to believe that Harvey was not in hearty accord with the King's efforts to overthrow Parliament and English Puritanism, yet he could scarcely have been so indifferent to the fortunes and personal safety of his faithful friend and patron as the above act would indicate. Making due allowance for his age (sixty-four years), we certainly would not expect to find "the greatest of the great physicians of comparatively modern times, perhaps of any time" (p. 56), quietly reading in a safe retreat, when the promptings of common humanity would have called him to the side of the wounded and dying. While Dr. Da Costa himself seems to have some doubts about the truthfulness of the story, he offers the following interpretation of Harvey's conduct, which differs from the one usually given. "No, if Harvey acted as he has been said to have acted, he did so because he wished to give confidence to the young Princes and to impart to them his own coolness." (p. 23.)

We fail to see wherein this explanation places Harvey in any better light; and moreover the ages of the children would militate strongly against the above supposition. The children were the Prince of Wales, and the Duke of York, afterwards Charles II., and James II. of England, and on the occurrence of the fight at Edgehill (1642) were aged respectively twelve years and nine years. If the action of Harvey was for the purpose indicated by the author, his bungling method of infusing confidence into mere children can only be explained by the fact that Harvey himself was childless, and hence inexperienced as a nurse. In fact the whole account reads more like a *myth* than a *reality*, and certainly ill accords with the character of Harvey as portrayed in the address before us. It is highly probable and certainly more charitable to believe that the story, to say the least of it, is highly coloured by the vivid fancy of the gossiping Aubrey.

The reader is doubtless familiar with the able and learned paper in the July number of this Journal by Dr. Forbes, in which he seeks to show, in opposition to the general verdict, that Harvey was fully acquainted with and the first to point out the capillary circulation. Dr. Da Costa takes exceptions to this view, and in a lengthy foot-note states his reasons for its rejection. The whole question hinges

upon the meaning which Harvey attached to the word *porositates*, the porosities through which he thought the blood to flow from the arteries into the veins. While we acknowledge our incompetency to act as referee in this *battle of words*, it seems to us that other proofs will have to be brought forward before we can credit Harvey with actual *knowledge* of the complete circuit of the blood, yet it must, in justice, be admitted that certain passages quoted by Dr. Forbes look amazingly as if he did possess such knowledge. In conclusion, we would heartily recommend this address to any who wish to spend a pleasant and profitable hour with the "Father of modern physiology."

W. J. C.

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ART. XXXIII.—*The Theory and Practice of Non-Restraint in the Treatment of the Insane.* By W. LAUDER LINDSAY, M.D., F.R.S.E., Physician to the Murray Royal Institution, Perth. From the *Edinburgh Medical Journal*, April and June, 1878.

*Restraint in the Treatment of Insanity.* By G. F. BODINGTON, M.D., Member of the Royal College of Physicians. From the *Birmingham Medical Review*, October, 1878.

WE have been often told that in the management of the insane in the hospitals and asylums of Great Britain, the use of mechanical restraint upon the person was entirely abolished. The fact has been widely proclaimed as a great and glorious advance in the cause of humanity, challenging the admiration of the world. Any doubts as to the humanity or wisdom of this remarkable step have always been attributed, with a rather pharisaical air, to indolence, unskilfulness, or a lack of any nice discernment of the ways and feelings of the insane. It is forty years and more since complete non-restraint was first begun to be practised in England, and yet the example has found no followers in this country, and few, if any, on the continent. Indeed, we have learned at last, notwithstanding the abounding confidence expressed in it by writers in books and periodicals, by superintendents of hospitals, and commissioners in lunacy, and the severe strictures, coming from such sources, upon all, and especially us on this side of the water, who are unable to see it in this light, that the method of complete non-restraint is far from being universally followed even in England. We have more than suspected this in spite of its positive denial by many who were supposed to speak by authority. We more than suspected that this idea of abolishing all restraint upon the insane, now and forever, was pervaded by a large element of the sensational, and that influences outside of the hospitals had more to do with it than the practical experience of their officers. That we were not mistaken is abundantly shown by Dr. Lindsay, who tells us that restraint is used in many of the largest hospitals and private asylums in England and Scotland, and even in some where it is supposed to be prohibited. His testimony, accompanied as it is by names, and other circumstances, settles this question, and we hope never more to be reproached for not following a method of management triumphantly established in Great Britain by universal consent. It is no part of our purpose at present to follow Dr. Lindsay in his exposition of the subject, showing as it does, besides the fact that restraint is not there abolished, the mischief arising from its disuse, and the benefit obtained from its judicious use. We only wish to show that the statement so confidently made, both here and abroad, respecting the abandonment of all mechanical restraint, is not true, and that the obloquy attempted to be fastened upon us for preferring the old ways is utterly undeserved.

Dr. Bodington, the honoured superintendent of a large private asylum, charges the non-restraint system with being the parent of many mischievous practices—violent struggles between patients and attendants, wounds, bruises, broken ribs, and prolonged irritation. He declares most truly that if a patient is to be restrained it had better be done by means of leather or canvas than by the hands of attendants, because the latter are apt to provoke opposition and struggles, even under the most favourable circumstances. But until it is possible, as the Doctor says, to obtain angels as attendants, we need not expect the unintermitting forbearance and unvarying command of temper demanded by Conolly and his followers. The radical fault with the non-restraint people is, unquestionably, “that they do not confront the realities of the case. They try, on the contrary, to fit everything to theoretical, ideal, imaginary views.”

What we prize most in these pamphlets is their outspoken protest against the arrogant assumptions of the advocates of non-restraint that they alone are wise, even beyond any possibility of mistake or doubt, supported as they are by a strong popular sentiment, while their opponents, including most of the honoured names in this field of professional labour, in Germany, France, and America, are behind the age, guilty, every day, of cruel and barbarous practices. We honour the courage implied in a stand like this, for it is a stand in favour of the right of private judgment, as sacred in the field of scientific inquiry as it is in that of politics and religion. The time is coming ere long, we trust, when it will seem almost incredible that, in this our time, men were debarred, by force of a rigid proscription, from using a remedial measure which they considered as conducive to cure and comfort as any drug or article of food.

I. R.

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ART. XXXIV.—*A Manual of Anthropometry, or a Guide to the Physical Examination and Measurement of the Human Body.* By CHARLES ROBERTS, F.R.C.S. 8vo. pp. xxiv., 118. London: J. & A. Churchill, 1878.

MR. ROBERTS is pursuing a valuable line of research, and has already done excellent work in his “Physical Requirements of Factory Children,” and “Physical Development and Proportions of the Human Body” (see this Journal, Oct. 1877, p. 492). The book before us is written for the purpose of stimulating, and so to speak, co-ordinating the work of those who are interested in this department of knowledge. When a sufficient mass of facts shall have been accumulated, his intention is to write a standard work on the proportions of the human body as ascertained by facts gathered from as many and as widely diverse points as possible, together with discussions on the influences of climate, occupation, food, age, etc., and finally the application of these facts to the improvement of health, and the establishment of an artistic canon of proportions. In its statements of facts, there is little to be noted that has not been referred to in the notice already cited. The chief object of the work is to give scientific accuracy and identity to the various measurements taken, by means of an excellent chart that is prefixed to the book, and by the directions for its use that are found in the text. As we would naturally expect in one who advocates so warmly and so justly the introduction of exact measurements, both of weight and length, he is himself extremely exact and careful. Thus, he does not forget the influence of eating and fasting on the weight, the different weight of the clothing at different ages, or the difference in the circumference of the biceps, and other muscles, after exercise and before. The only indefiniteness we have found is in using “the malleolus”

in measurements of the lower extremity. The exact point on so large a surface should have been specified. We notice also two curious spellings, "trypode" (p. 34), and "enciform" (p. 48), neither of which finds any etymological justification. A very complete bibliography is prefaced to the book, for much of which the author is indebted to the report of Dr. J. H. Baxter, U. S. A., and forms an invaluable addition for those who are engaged in any allied work. We commend the book heartily to all who are interested in the subject, as by far the best on the subject that we know. It is no little comfort, also, to read a book which has such excellent paper and type.

W. W. K.

ART. XXXV.—*Relative Frequency of Colour-Blindness in Males and Females.*

By B. JOY JEFFRIES, M.D., Ophthalmic Surgeon to Massachusetts Eye and Ear Infirmary, etc. Reprint from *Boston Medical and Surgical Journal*, July 25, 1878.

IN a recent article on the dangers of colour-blindness, reviewed in the last number of this Journal, Dr. Jeffries stated incidentally that "it has frequently been said that colour-blindness was less common among females than males. This is *probably* incorrect, and due to the fact that such a defect is of more importance with the female sex, and, therefore, more carefully concealed. They have not been tested as males have; and most likely future statistics, based on true methods of testing, will refute the now quite general impression as to their having better colour perception, and hence to be preferred, when admissible, as railroad employés." Prof. Holmgren, while he does not deny the correctness of the general impression that colour-blindness is less frequent among women than among men, and even admits its probability, says that the necessary information to establish the fact is yet wanting. (Colour-blindness with Relation to Accidents by Land and Sea, translated in *Report of Smithsonian Institution* for 1877.)

Until quite recently the most extended observations bearing on this point were those of Dr. H. Dor, of Bern, who, in 1860, reported that in an examination of 611 women he had found less than one per cent. colour-blind. The method of examination adopted was practically the same as that of Holmgren, being based upon the sorting of coloured worsteds. Any test based on the naming of colours might be held to prove only that women have greater quickness and readiness, and a greater familiarity with colours than men have. In the determination of this and similar questions, the importance of using a rational test, and having it carefully and skilfully carried out by competent persons, cannot be too strongly insisted upon. It is by no means so easy and simple a matter as might at first sight be imagined, and Prof. H. complains of the inefficient use of his method of testing, even by prominent ophthalmic surgeons. An explanation of the principles of this method, and full directions for carrying it out, can be found in the pamphlet above referred to.

The results reported by Dr. Jeffries speak in no uncertain voice in favour of the comparative immunity from colour-blindness enjoyed by women. His examinations were made in various educational institutions, and showed that in 1021 males the proportion of colour-blind was one in twenty-two, while but a solitary case was found among 1025 females.

He also quotes from recent reports of Drs. Cohn and Magnus, who found only one colour-blind among 2318 school girls tested in Breslau.

Dr. Jeffries is still engaged in this work, and up to the present date has tested



1892 females, and has found only two cases of colour-blindness among them. This, in connection with the examinations at Breslau, gives a result of only three colour-blind among 4210 females.

This question is by no means a matter of mere idle curiosity, but may have an important physiological bearing. If more extended researches establish this strong contrast between the sexes it cannot, of course, be considered the result of chance, but must have some principle behind it. The only theory proposed is that of heredity, which supposes that as women are, as a rule, much more occupied with colours than men are, the greater exercise of the chromatic sense results, in the course of generations, in its more perfect development and less liability to imperfections. This theory has already been used as an argument by those who maintain that colour-blindness may be cured or diminished by exercise with colours. This argument seems to us not a very strong one, as the effect of constant use through many generations may readily be admitted without implying that a corresponding tendency is perceptible in the individual. The fact of the extremely rare occurrence of this defect in females may be more available, however, for those who advocate, with Geiger and Magnus, the evolution of the colour sense, though we believe it has not yet been pressed into this service.

Wallace says (*Tropical Nature and other Essays*) that "the fact that colour-blindness is so prevalent is an indication that the fully-developed colour-sense is not of primary importance to man. If it had been so, natural selection would have eliminated the defect," or at least lessened the liability to its recurrence. It will scarcely be held that a fully-developed colour-sense is of more vital importance, in the struggle for existence, to women than to men. Perhaps, after all, it will be easier, at least, to take an æsthetic view of the question, and to admit that a full appreciation of all the glories of the solar spectrum is simply more demanded by the higher nature of the gentler sex, and that "the emotions excited by colour and by music, alike, seem to rise above the level of a world developed on purely utilitarian principles."

G. C. H.

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ART. XXXVI.—*A Handbook of Nursing for Family and General Use.* Prepared under the direction of the Connecticut Training School for Nurses, State Hospital, New Haven. 8vo. pp. 266. Philadelphia: J. B. Lippincott & Co., 1879.

A THOROUGHLY good book by an experienced and thoroughly sensible man, whoever he be that has written it. It provides not only for the now large and rapidly increasing class of intelligent professional nurses much good advice and instruction concerning nearly everything they will have to do, but it will be even a greater boon in many respects for those who are compelled to nurse their own families or friends, who desire to do the best possible service, but, from inexperience and want of teaching, know not what to do.

The book is divided into three parts: I. Medical and Surgical Nursing; II. Monthly Nursing; and III. Family Hygiene. Under the first head, not only every ordinary hint is given, but the nurse is taught how to use the thermometer, to take the pulse and respiration, what to observe about them, and the meaning of the chief deviations from the normal, and what should be observed and reported as to the urine. Special directions are given as to surgical nursing, as to nursing in certain medical diseases, as to the nursing of children, as to disinfection, and finally, rules of conduct in emergencies.

The second part is really not a handbook for nurses so much as for midwives, but is very good and plain. The third part is limited in its scope, but good as far as it goes.

In way of criticism, we could wish here for an earnest protest against school and family usages which are making more than half our educated people myopes. In the first part a useful addition would be an excellent plan for keeping a tumbler of cracked ice by a flannel funnel reaching nearly to the bottom of the tumbler, with a small hole to let the water out. Directions as to what should be observed and reported as to the feces are also quite as important as the urine. But a really serious fault is the direction (p. 41) for passing an enema syringe point: "Apply first in a backward direction and then forward a little, very gently." "Precisely wrong," as our old Professor of Latin used to say but too frequently to us. The direction of the rectum for the first inch from the anus is in a line from the anus to the umbilicus, and then curving sharply backwards it follows the concavity of the sacrum and coccyx. The directions should therefore read: "Pass the point into the anus for one inch in the direction of the navel and then swing it round so that it will point upwards and a little backwards, when it should be gently pushed on." For want of this simple knowledge on the part of both nurses and doctors, many a patient dreads an enema instead of finding it not only painless but a source of great relief.

W. W. K.

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ART. XXXVII.—*On the Therapeutic Forces; an Effort to Consider the Action of Medicines in the Light of the Modern Doctrine of the Conservation of Force.* By THOMAS J. MAYS, M.D., Member of Luzerne County Medical Society, etc. 8vo. pp. 143. Philadelphia: Lindsay & Blakiston, 1878.

FROM the remote period when physicians first began to think of the mode of action of remedies until the present, there have not been wanting theories and speculations concerning the *modus operandi* of medicines. But the adoption of late years of improved methods of study, marked by the introduction of instruments of precision into pathology and practical medicine by which morbid states and processes are clearly recognized, has finally established, with the aid of the accumulated testimony of experiments on living animals, a fund of common knowledge of the action of remedies, upon which it would seem that, now if ever, the foundation for a therapeutic science might be safely laid. Add to this the advance in physiology proper, more particularly towards an exact knowledge of the chemistry and dynamics of food, and a hint is obtained of the direction in which therapeutists have been seeking for the clue to guide them from the mazes of empiricism.

The works of Ringer, Bence Jones, Brunton, Wood, Fothergill, and others have contributed greatly to placing Rational Therapeutics upon a sound basis, and aided in creating a healthy sentiment against the tendency to an aimless administration of active agents and routine prescribing. Dr. Mays, in the first portion of this little volume before us, recites some of the experiments and processes by which the force-producing qualities of the different proximate principles have been ascertained and estimated, and associates with them Prof. Tyndall's conclusions from his consideration of Heat as a Mode of Motion, which, by the way, evidently furnishes the inspiration for the present work.

The study of the action of remedies would be much simplified by the general adoption of Dr. Mays's theory, which is "that our therapeutic forces, when

viewed from the standpoint of life, can be divided into two great classes, viz., those which move in harmony with the vital forces, and those which move in antagonism to them;" which is simplicity itself. The application of the theory depends upon this fundamental principle, in the author's words, "Now, muscle, same as every other compound body, is molecular in its elementary structure." Like the execution of Charles I., which was so difficult to keep out of Mr. Dick's celebrated memorial, we notice this molecular motion cropping out repeatedly in unexpected places on almost every page of the book. Grouping therapeutic agents under his theory of their action, we find that chemical stimulants, including hydro-carbons, carbo-hydrates, alcohol, phosphorus, and oxygen, all produce molecular motion of a distinct kind from mechanical stimulants, which title covers quinia, quassia, barberry, columbo, gentian, nectandra, and others such as ammonia, iodine and the iodides, cold, opium, antimony, croton oil, cantharides, mustard, turpentine, tar, poultices, baths, friction, etc. In the course of the consideration of the action of these agents, however, it is just to state, that many very useful and practical hints are given, apart from any theory. The mode of action of quinia is thus graphically stated:—

"Quinia, in small doses, is analogous in its action to a mild force of wind blowing across a field of tall grass. That it moves in a direction contrary to that of, and comes in contact with, the weaker molecular forces in the body, and motion necessarily takes place in the line of least resistance, which is in consonance with that of the attacking force, until at such a point where a momentary equilibrium is restored by the action of the bodily force, after which motion takes place in an opposite direction. By the prolonged action of quinia a series of such oscillations or waves is produced, and in this way the bodily molecules are impelled to their former degree of energy and activity; they thus acquire an additional amount of strength, which will remain even after the attacking force has subsided."

So much for quinia. As soon as the therapeutist can see the remaining elements of the *materia medica* in this particular light, the acknowledgment of the correlation of the therapeutical with the remaining physical forces becomes imperative. As for the doctrine of the conservation of force, if it does not thereby receive further confirmation, it will be gratifying, at least, to remember that, as a fundamental principle, it does not need it.

F. W.

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ART. XXXVIII.—*The Antagonism of Therapeutic Agents, and What it Teaches.* The Essay to which was awarded the Fothergillian Gold Medal of the Medical Society of London for 1878. By J. MILNER FOTHERGILL, M.D. Edin., Assistant Physician to West London Hospital. 12mo. pp. viii., 160. Philadelphia: H. C. Lea, 1878.

DR. FOTHERGILL'S Essay on the Antagonism of Medicines is essentially a compilation of some of the more important experiments which have been made upon this subject, with special consideration of the principles which should govern the practical application of the facts thus deduced to treatment of cases of poisoning and the therapeutic principles resulting from their study. The application of the results of experimental investigation to the data of clinical experience is always profitable, and while those who are moderately conversant with the literature of his subject will find in Dr. Fothergill's book little, if anything, that is novel, those who have not been so diligent will here find much that is improving, while all is interesting.

We cannot but think, however, that those who are not familiar with the subject of the author's work, will obtain from it but a confused notion of the actual facts of the case and the immense importance of the principles involved. A few tabular statements of the contrasted *modus operandi* of the different drugs would have greatly increased the value of the work to those who wished merely to refresh their memory, while they would have been invaluable to those who under Dr. Fothergill's guidance enter this field of study for the first time.

R. M. S.

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ART. XXXIX.—*Phosphates in Nutrition, and the Mineral Theory of Consumption and Allied Diseases.* By M. F. ANDERSON, L.R.C.P. Ed., and M.R.C.S. Eng. 8vo. pp. 178, xxvii. London: Baillière, Tindall & Cox, 1878.

THE fact that the value of a food is dependent not only upon its organic, but also upon its inorganic constituents, is generally acknowledged; and experimental physiology by means of exact observation and chemical analysis has pretty clearly defined the role of each class of proximate principles in nutrition. A series of experiments undertaken by the author, to ascertain the use of phosphoric acid in animal and vegetable life, placed in his possession certain data, which subsequently led him to entertain views somewhat different from those generally held concerning the part played by the phosphates in nutrition, and which appeared to offer a novel explanation of the cause of certain diathetic diseases; such as consumption, scurvy, and wasting disorders generally.

Contrary to the generally received opinion that a small amount of uncombined phosphorus exists in the blood and in the brain as phosphorized fat, or lecithine (Hoppe-Seyler), and protagon, Dr. Anderson concludes that "phosphorus has no existence in the elementary state, or in any other form than that of phosphatic acid or a phosphate, in either the vegetable or animal kingdom."

The success of scientific agriculturists in feeding plants, from the application of knowledge obtained by the chemical analysis of the soil, and of the plant itself, leads to the query, "Cannot the doctrines of agricultural chemistry be turned to profitable account in investigating the requirements of the different tissues for inorganic material, and ascertaining how far the different kinds of food fulfil their requirements?" which is the line of investigation pursued in this work.

In the processes of nutrition the capillaries are the agents directly concerned. In all tissues and organs containing capillaries, phosphoric acid in a tribasic state of combination, with lime, magnesia and soda or potassa, is constantly present; this is termed "tissue phosphate." The capillaries are not separable from the surrounding structures for examination; but as it was found that the endothelial lining of the arteries contained a large amount of this salt, the inference is drawn from this and other considerations that "the presence of tribasic phosphate in all the organs of the body is dependent on its entering into capillary formation." Great stress is laid upon capillary innutrition as the cause of certain organic diseases, for the following reasons, as stated by the author:—

"The inorganic chemistry of the tissues shows the presence of tissue phosphate in the arteries, and in all the vascular tissues, and in no other tissues is it to be found; food shows the source of this phosphoric supply; and the urine of man gives evidence of the constant presence of the component parts of this triple salt, evidently as the result of tissue metamorphosis, independently of food influence. In all cases of death from any of the diseases included in the list given,

where I have had opportunities of examining the vascular tissues, there showed mineral deficiency as compared with corresponding healthy tissues."

In the treatment of wasting diseases, the usefulness of the hypophosphites and phosphoric acid is recognized, but phosphoric acid alone cannot form the tissue phosphate; the whole salt should be given, or all the materials for its formation supplied. In the same manner "hypophosphorous acid has no place in tissue formation, it is only by conversion into phosphoric acid that it can be utilized," and in fact the recorded cases show that where it has been most successful, "it has been given under conditions to utilize the acid and the base, as factors of tissue phosphate." Notes of several cases of consumption treated by the tissue phosphate are given where its administration was followed by marked benefit; and hopes are held out that by this means incipient phthisis may be permanently relieved.

A difference of opinion may exist concerning the view entertained by Dr. Anderson of the rationale of the administration of lime juice in scurvy, but as the conclusions are not affected by it, we need not here stop to discuss it.

This little work represents a large amount of patient, well-directed, original investigation for which the author deserves much credit. The results of his studies and analytical researches tend to throw light upon the causes of obscure constitutional diseases, and lay the groundwork for a more rational method of their treatment.

F. W.

ART. XL.—*Transactions of State Medical Societies.*

1. *Transactions of the Medical and Chirurgical Faculty of the State of Maryland*, April, 1878, pp. 208. Baltimore, Md., 1878.
2. *Transactions of the South Carolina Medical Association*, April, 1878, pp. xlv., 89. Charleston, S. C., 1878.
3. *Medical Communications of the Massachusetts Medical Society*. Second series, Vol. viii., Part iv. Boston, Mass., 1878.
4. *Transactions of the Medical Society of the State of California*, 1877-8, pp. 275. Sacramento, Cal., 1878.
5. *Transactions of the Medical Society of the State of North Carolina*, May, 1878, pp. 103. Wilmington, 1878.
6. *Transactions of the Medical Society of the State of New York* for 1878, pp. 339. Syracuse, N. Y., 1878.
7. *Transactions of the Medical Society of New Jersey* for 1878, pp. 390. Newark, N. J., 1878.

1. THE neat issue of the *Maryland Faculty* contains a loving and appreciative *Notice of Dr. Nathan R. Smith*, who recently died at the age of eighty. The memoir is by Dr. S. C. Chew, brief, well written, and accompanied with a photographic portrait.

Dr. A. P. Smith, in a paper describing his *Fifty-two Successful Cases of Lithotomy*, gives an account (with illustrations) of a case of *double bladder and double penis*. The scrotum and testes were normal. The twin external organs were rather small, destitute of prepuce, and at first sight perfectly symmetrical. In one, however, the urethra was found normal, while in the other it ended just in front of the scrotum. At the choice of the patient urine could be voided from either. The excretion varied in quality, so much as to demonstrate complete separation of the two bladders. There was some deficiency of the abdominal walls in front of the bladder. A more exact description of many points in this

case would have been very interesting. Dr. Smith attributes the uniformity of his success to the use of the lithotome invented by his father, Dr. N. R. Smith.

Two cases of extroverted bladder are reported by Dr. Monmonier.

Dr. Friedenwald calls attention to *spasm of accommodation* as an optical trouble not always understood. Its occurrence and character in young school children are especially noted.

Dr. Thos. Brown condemns divulsion as a treatment of urethral stricture. Internal urethrotomy is much preferred. In forming his opinion he has been aided by a large body of correspondence from eminent surgeons.

Dr. Jos. A. White reports, with illustrations, a terrible case of bony tumour in the face of an infant, causing the loss of an eye and horrible deformity.

Dr. L. McLane Tiffany reports success in removing *naso-pharyngeal polypus* by Cheever's method, temporary depression of the entire upper jaw being resorted to, to procure room, and tracheotomy employed as a preliminary.

We regret that lack of space forbids notice of several other valuable papers.

2. We learn from the *South Carolina* publication that the profession, and intelligent business men of the Southern States deeply feel the need of judicious National legislation, to replace the present conflicting and often unwise quarantine regulations of different localities. In response to petitions Congress did pass a bill requiring consuls to report the prevalence of epidemics to the Bureau of Marine Hospital Service. But it surely comes within the scope of Congressional right and duty to assume the entire charge of public health in all States, so far as affected by commercial relations.

Perhaps the principal paper in this collection is upon *Yellow fever, as observed at Port Royal in 1877*, by Dr. M. Simons. Fully satisfied that at some times and places epidemics have presented features of a hybrid or malarial or doubtful character, the writer states that on this occasion the cases were all typical. Malarial fevers appeared, as usual, running their course as if wholly unaffected by the epidemic. The effects of a stiff dose of quinia would always settle the question of diagnosis. The yellow fever attacked none who had suffered previous attacks of undoubted genuineness. Dr. Simons attributes the epidemic distinctly and solely to importation by means of vessels. Other theories of causation are pretty thoroughly examined, but do not seem to fit the facts.

Dr. Kinloch reports a curious case, supposed to be one of rupture or *injury to the external iliac artery*, though without any lesion of integument save severe bruises. Gangrene occurred, necessitating amputation below the knee.

Dr. Nardin, by *lateral lithotomy*, removed an eight ounce stone from the bladder of a young coloured man. The circumferences of the concretion were  $8\frac{1}{4}$  by  $9\frac{1}{2}$  inches. A good recovery ensued, in spite of symptoms of recto-urethral fistula, which gradually disappeared.

3. The present number of the *Massachusetts* publication contains a most admirable "annual discourse" by Dr. Francis Minot, brimful of good sense, modestly entitled *Hints on Ethics and Hygiene*. We had marked for quotation passages on medical education, school hygiene, and on the question of admitting women to full educational and professional privileges, but, despairing at the amount of riches, we will merely recommend the whole essay to all who can gain access to it.

Dr. Thos. Dwight has a very elaborate treatise on *The Identification of the Human Skeleton*, for which the Society awarded him a prize. A notice of this will be found on another page.

In an article on *Floating Spleen* we find some curious statements and extracts

from ancient writers. Plinius Secundus speaks disrespectfully of the organ; says it impedes the speed of the athlete in running; reports that it may be safely removed, with the sole harm of destroying the laughing proclivities of the patient; "for sure it is that intemperate laughers have always great spleens." This seems rather opposite to our common notions and expressions. Some writers even as late as the seventeenth century speak of fleetness as interfered with by the organ, and assert its occasional removal from professional runners. The paper is by Dr. Frederick C. Shattuck.

Dr. Rotch has been making experiments on the cadaver, to determine for diagnostic purposes the *area of dullness*, its exact shape, size, and limits, *caused by pericardial effusion*. Melted cocoa butter was used, by injection into the heart-sac. Of course the amount of injection was carefully noted in relation to the percussion sound. Guidance as to proper place for puncture is believed to be derived from such experiments. We are not sure whether the observer sufficiently considered the difference between dead and living organs, and between manifold conditions of life and death. Certainly he would seem to have somewhat overlooked this important matter. We would not, however, deny the great interest and value of his experiments. He considers absence of resonance in the fifth intercostal space, right side, as pathognomonic of pericardial effusion.

4. We are glad to learn from the *California Transactions* that the noble example of Harvard has borne good fruit even on the distant shores of the Pacific. The Medical Department of the State University and the Medical College of the Pacific have established a three-years' graded course of study. The report of Dr. H. S. Orme on *Medical Education* takes the highest ground, quoting the latest words of Prof. Pepper, Sir Wm. Gull, and Dr. N. S. Davis.

The experience of Dr. F. W. Hatch, as to *diphtheria*, leads him to believe that insanitary conditions may, and do, at times, originate the disease.

The grave questions concerning infant mortality, especially in asylums, are judiciously treated by the gentleman last named.

Dr. John Scott, in a paper on *Uterine Fibroids*, deprecates the frequent practice of dilating the os uteri, as often productive of constitutional irritation, leading on to destructive pyæmia or septicæmia. Simple incision, he regards as far safer, either as substitute for, or antecedent to, dilatation for removal of these tumours.

Dr. James Murphy contributes to the literature of excisional surgery several original cases of operation on the ankle-joint, with critical *résumé* of opinion on the subject, and a warm advocacy of this form of conservative surgery.

There are a number of more or less able and instructive essays and reports, needing, however, no particular comment.

5. One quite elaborate paper in the *North Carolina Transactions*, as well as a briefer one, and a discussion, indicate that diphtheria is arresting much attention there, as further north.

The retiring president, Dr. Payne, deals, in his valedictory address, with the curious and much disputed subject of *ante-natal impressions*. He contributes some new and singular cases to the already extensive literature of this subject. An instance of snake-resemblance calls to mind a very extraordinary one published several years ago in the *Journal of Insanity*, as well as Dr. Holmes's unhappy heroine in "Elsie Venner."

6. Before the *New York Society* Dr. Stephen Smith describes with enthusiastic advocacy the advantages and the practical methods of *antiseptic surgery*. A number of critical operations are given to illustrate its successful workings.

Dr. Arthur Mathewson, of the Brooklyn Eye and Ear Hospital, illustrates with four original cases the *diagnosis of intra-cranial tumours* from the ophthalmoscopic appearances of the "optic disks."

Some surgical notes by Dr. Giberson describe a *cure* (at least, temporary) of *sciatica by nerve-stretching*. The force used by the surgeon's finger, passed under the sheathed nerve, between the great trochanter and the tuberosity of the ischium, is said to have been "nearly if not quite sufficient to lift the extremity from the table." The wound did not heal kindly, being followed by unhealthy suppuration, phlebitis, and septicæmia; but the neuralgia ceased from that time, and no paralysis occurred of sense or motion. The cure, real or apparent, had endured about three and a half months.

Some notes of *operations under nitrous oxide* are furnished by the same gentleman, who evidently thinks highly of this anæsthetic. The gravest case was an arm amputation, high up. The discussion ensuing exhibited great diversity of opinions. One gentleman (we forbear to mention his name) calmly asked if there be any anæsthetic "safer and better than pure chloroform."

Dr. Bulkley has a sensible article about *Diet and Hygiene in Diseases of the Skin*.

Several papers appear in which school hygiene and the actual condition of schools are dealt with. Our readers have recently heard a good deal about this matter, so we will only say that from an account here given, some of the schools in Brooklyn have reached a lower depth of disgraceful unwholesomeness than any yet described.

Dr. Benedict reports a case in which fifteen inches of small intestine, becoming intussuscepted, sloughed and came away. Apparently the patient never fully regained her health; but, upon dying, five months later, perfect reparative union was found to have occurred, about nine inches above the cæcal valve. The calibre of the tube, however, was reduced to a quarter-inch, for two or three inches.

7. The portly volume from *New Jersey* contains three formal essays, of considerable length and merit. The first is by Dr. A. N. Dougherty, upon *glycosuria*. The writer apparently has fortunately encountered only cases of recent origin or dependent on special and temporary causes. He allows a tolerably liberal and varied diet, though insisting on a bread free from starch, and eulogizing the English article known as Camplin's flour.

The other essays are by Dr. Ryerson, upon the *rectification of abnormal presentations in labour*, and by Dr. Deshler upon the *relations of the profession to the public health*. The latter strives especially to secure legislative provision for an efficient registration of births, marriages, and deaths. And lastly, in an article on *opium inebriety*, Dr. J. B. Mattison gives some well-deserved rebukes to "domestic hypodermic medication." It is notorious, as he says, that physicians, by loose and frequent use of the syringe, suggest, if they do not absolutely commend, the idea of its discretionary employment by their patients.

In a somewhat *epidemic dysentery* which prevailed widely in one section, blistering the abdomen with cantharides almost invariably produced a free fecal discharge and great relief.

A case of *spontaneous rupture of the colon*, twelve inches above the sigmoid flexure, is reported. There was a stricture below, but no ulceration or gangrene. The patient was a man over eighty, and the catastrophe happened during sleep, at night.

Questions as to the *contagiousness of phthisis* have elicited a number of expressions in the affirmative.

Malarial diseases, with diphtheria, and, in one county, something like typhomalarial, seem to have been the diseases most noticed.

B. L. R.



ART. XLII.—*A Treatise on the Science and Practice of Midwifery.* By W. S. PLAYFAIR, M.D., F.R.C.P., *Professor of Obstetric Medicine in King's College, etc.* With notes and additions by ROBERT P. HARRIS, M.D. Second American from the second revised London edition. 8vo., pp. 639. Philadelphia: Henry C. Lea, 1878.

WE record this speedy appearance of a second edition of this work with pleasure and gratification, because it sustains and justifies the high opinion expressed of its merits two years ago. There has been a general unanimity of opinion in the profession as to the high character of Dr. Playfair's work, both as a manual for the student and a book of reference for the practitioner, and the revision and additions made to the second edition will not lower this favourable estimate of it.

A very handsome and complimentary dedication of this edition is made to Dr. T. Gaillard Thomas, and since the second edition of Barnes on Diseases of Women has just appeared with a dedication to Fordyce Barker, we must conclude that the claims of this country to consideration in the medical world are fairly and fully recognized. The compliment cannot but be as gratifying to the profession at large, as it is flattering to the individual gentlemen named who have so well earned their honors.

We should have been glad to note a change in one or two of the illustrations, and there are but one or two that are bad. The one on p. 470 presents a distinct contradiction to the text; it is said to represent the last stage of delivery of the head with the forceps, the handles turned upwards towards the abdomen, but they certainly are not turned upwards, nor could they be with the grasp the operator has of them. That this error should have been perpetuated to a second edition is most surprising.

The subject of version by the bimanual method remains as in the first edition: that is, there is no recognition of the claims of Dr. Wright of Cincinnati to priority in regard to a very considerable share of this improvement in midwifery. We have the very highest authority for saying, however, that these claims are fully recognized by Dr. Playfair, and that he has expressed regret that he was not aware of them in time to incorporate the fact in this edition. All other recognition must of course yield to that of Dr. Braxton Hicks himself, and since he has spoken upon the subject the opinions of others are of little moment. In the *Cincinnati Lancet and Clinic* of August 24, 1878, Dr. Hicks has a communication in which he fully concedes Dr. Wright's claims to priority as to a large portion of the manœuvres, while he yields none of his own as to original and independent discovery.

The additions made by Dr. Harris are of such a character as to make us wish that they were more in number and greater in extent. The description of the leading varieties of forceps of the teachers and writers of this country, with the illustrations of delivery with this instrument in the dorsal position of the patient, the only course pursued here, are of great value and interest to the student, and fill a want seriously felt in the first edition. Dr. Harris has connected his name most intimately with everything relating to the Cæsarean section in this country, and his researches have shown a result here so much more favourable than British statistics, that it cannot but influence the judgment of the profession in having recourse to this formidable operation. His additions upon this subject are therefore of great importance. An appendix upon the transfusion of milk presents all of value upon this procedure.

J. C. R.

ART. XLII.—*Cyclopædia of the Practice of Medicine*. Edited by Dr. H. Von ZIEMSEN, Professor of Clinical Medicine in Munich, Bavaria. Vol. VIII. *Diseases of the Chylopoetic System, with Chapters relating to Diseases of the Bladder and Urethra, and Functional Affections of the Male Genital Organs*. By Prof. F. A. ZENKER, of Erlangen; Prof. H. Von ZIEMSEN, of Munich; Prof. F. MOSLER, of Greifswald; Prof. N. FRIEDERICH, of Heidelberg; Dr. G. MERKEL, of Nürnberg; Dr. J. BAUER, of Munich; Prof. H. Lebert, of Vevey; and Dr. H. CURSCHMAN, of Berlin. ALBERT H. BUCK, M.D., New York, Editor of American Edition. 8vo. pp. xiv., 935. New York: William Wood & Co., 1878.

THE present volume of this series contains articles on the diseases of œsophagus, peritoneum, spleen, pancreas, and supra-renal capsules—parts of the chylopoetic system not treated of in vol. vii., which was noticed in the July number of this Journal for 1877. It also contains chapters on diseases of the bladder and urethra, which are generally not included in treatises on the practice of medicine. The volume comes to us just before going to press, and we have had time therefore to read rather cursorily only the chapters on diseases of the spleen and pancreas. Our notice of preceding volumes has been so full, and the merits of the series is so well established, that a mere announcement of the appearance of another volume would perhaps be sufficient.

Prof. Mosler, who is the author of the chapters on diseases of the spleen, lays down some very good rules for the physical examination of this organ, illustrating his remarks by a couple of diagrams which make them very much more intelligible than they otherwise would be. We know from some experience in teaching that the determination of the size of the spleen is in many cases a task of extreme difficulty, and the student will therefore do well to make himself thoroughly acquainted with the rules which the author lays down for his guidance.

When speaking of enlargement of the spleen Prof. Mosler takes occasion to propose a plan of treatment, which he has, however, never carried out. The favourable results of subcutaneous injection of tincture of iodine in glandular tumours, especially in the thyroid gland, has led him, he says, to think that it might be desirable to extend the same treatment to the spleen. If a subcutaneous injection were all that he really means to recommend, there would of course be no serious objection to it, but an injection into the gland itself might possibly excite peritonitis, which would prove difficult to control. The animals who were subjected to this experiment, “bore,” to use his own words, “this operation without intense peritonitis,” which may possibly have been excited quite as much by the withdrawal from the abdomen of the spleen (previously to injecting it), by a wound in the linea alba. He has, however, injected dilute carbolic acid into an enlarged spleen with such favourable results that, he says, he feels further experiment to be demanded. Oddly enough, he makes no allusion, in this connection, to hypodermic injections of ergotine, which have been used with so much success by Prof. Da Costa<sup>1</sup> and others, both in this country and abroad, although he refers to them in the treatment of rupture of the spleen.

The author also recommends the application of the cold douche to the region of the spleen in the treatment of enlargement of that organ. “Besides the contractile influence produced,” he says, “through the skin upon the elements of the spleen, the vigorous irritation of the cold douche upon the spleen itself is to be considered, which increases its action. Besides this it stimulates to deeper

<sup>1</sup> See number of this Journal for January, 1875.

inspirations. By the sinking of the diaphragm there is produced a pressure on the spleen, and thereby a mechanical diminution.

The chapters on diseases of the pancreas are contributed by Prof. Friedrich, who, when speaking of the anatomy and physiology of this organ, calls attention to an abnormal arrangement of the bile-duct which he has repeatedly met with, and which is not without clinical interest. Instead of descending near the head of the pancreas towards the duodenum, it occasionally goes through the head, in such a way as to be sometimes only partially, sometimes entirely surrounded by gland substance. A comparatively small enlargement of the pancreas would therefore suffice to close the duct entirely. This explains the occurrence of obstinate jaundice in cases of disease of the pancreas, in which the liver is not directly affected. The author refers also to the fact that the pancreatic juice possesses absolutely no sugar-forming power over starch during infancy. This fact, if well known, is certainly often ignored by practitioners who prescribe one or other of the various farinaceous foods for infants even before dentition is begun.

We have selected from out the contents of the volume the articles on diseases of the spleen and pancreas, simply because they are subjects which are usually very briefly considered in systematic treatises on the practice of medicine. Indeed we are unaware of the existence of any monographs which treat of them so fully as do these two articles. We have no doubt from the reputation of their authors that the other articles are of equal excellence, but we have not had time to examine them critically.

J. H. H.

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ART. XLIII.—*The Journal of Physiology*. Edited, with the Co-operation in England of Prof. A. GAMGEE, F.R.S., of Manchester; Prof. W. RUTHERFORD, F.R.S., of Edinburgh; Prof. J. B. SANDERSON, F.R.S., of London; and in America of Prof. H. P. BOWDITCH, of Boston; Prof. H. N. MARTIN, of Baltimore; Prof. H. C. WOOD, of Philadelphia. By MICHAEL FOSTER, M.D., F.R.S., Trinity College, Cambridge. Vol. I., Nos. 1, 2, 3, 4, and 5. London: Macmillan & Co., 1878.

THE first number of the *Journal of Physiology* was issued last March in response to the long felt need of an English journal devoted to the interest of this science. Judging alone by the number of physiological papers formerly published in English and American journals, and more especially in the *Journal of Anatomy and Physiology*, it might have appeared that this special physiological medium was hardly called for, but the number, excellence, and variety of the papers published in the first five numbers of this new journal certainly indicate that the former dearth of material was not due to a lack of capable investigators. In fact, no better indication of the prominent position English-speaking physiologists are making for themselves could be desired than is found in the pages of this journal. Thirty original articles, in which America is fairly represented, have been published—articles occupying every branch of biological science from the “psychophysical” law of Fechner to the effects of starvation on the elimination of urea. All the articles are good, and show evidences of skilful work, while many, such as Sterling’s paper on “Hyperplasia of the muscular tissue of the Lungs,” Ringer and Murrell on the action of various drugs, etc. etc., will be of practical interest not only to the physiologist but to the practising physician.

Evidently English and American investigators have been stimulated to increased effort by the certainty of their views obtaining a wide and creditable circulation in the journal in whose management Dr. Foster and his distinguished co-editors

have displayed so much ability. If we will acknowledge then that the rapid increase in the number and value of English physiological investigations is due to the existence of a suitable medium for their circulation—is a true *post hoc ergo propter hoc*, then we must also acknowledge that the future of the English school of physiology lies in the hands of the general medical public, through whose liberal support alone can this worthy enterprise prosper.

Not the least valuable feature of the journal is the publication in each number of a complete list of papers of physiological interest which have appeared in the intervals of publication of the different parts, a list already occupying forty-one pages. We think, however, that its value would have been greatly enhanced by the publication not of the titles alone, but of short abstracts of each paper, such as were formerly published in the *Journal of Anatomy and Physiology*. Very often the title is but an indefinite index of the contents of a paper, and after the greatest difficulty in obtaining access to original memoirs, it is only to find that they contain nothing in reference to the point which it was desired to study. We hope that the annual reprint of this bibliography that the editors have promised will contain short abstracts of the contents as well as the titles of the physiological memoirs.

R. M. S.

ART. XLIV.—*The Cell Doctrine; its History and Present State; for the Use of Students in Medicine and Dentistry; also, A Copious Bibliography of the Subject.* By JAMES TYSON, M.D., Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, etc. etc. Second edition, revised, corrected, and enlarged. 12mo., pp. 202. Philadelphia: Lindsay & Blakiston, 1878.

THE modern histologist recognizes the “cell” as the ultimate physical element of organization, out of which all tissues, healthy or diseased, are formed. The modern physiologist localizes all of the so-called vital phenomena in the cell, and his science can, at present, do but little more than trace out the life-history of this elementary part. The discovery of these truths, like nearly all other discoveries, has a long history. In the volume before us Dr. Tyson has traced in chronological order the growth of this cell-doctrine from the crude *partes similes* of Aristotle and Galen, through its various evolutions down to the little clump of *bioplasm*, which modern science endows with the essential life-properties of reproduction, nutrition, and development.

The first edition of Dr. Tyson’s work appeared in 1870, and at once received the favourable reception from the profession to which it was entitled by its merits. The present edition shows an increase in size of about fifty pages, and almost every page furnishes evidence of careful revision.

In comparing it with the former edition, we have to mention aside from many alterations in the arrangement of the subject-matter, and the presence of several new illustrations, the addition of two new sections. The first epitomizes the doctrines of Addison, Waller, Cohnheim (1842; 1846, 1867), while the second sets forth the latest views of the structure of cells and nuclei (1877–1878), thus rendering the history complete to the date of publication.

The closing section, giving an excellent summary of the present *status* of the cell-doctrine, into which the author has incorporated his own views, has been entirely rewritten, as was necessitated by the very numerous and important contributions to the subject mentioned above.

The bibliography, highly valuable to the student who wishes to prosecute his

studies in this department of biology, occupies forty-four pages, and contains seven hundred and thirty-four references. The list now makes up nearly one-fourth of the book, and if it grows as rapidly in subsequent editions it will almost necessitate a change of title into "Bibliography of the Cell Doctrine, with an Historical Appendix." We would suggest the use of smaller type here. The addition of an index is a great convenience in referring to the contents.

Dr. Tyson divides the evolution of the cell doctrine into three periods; these include respectively the time prior to the discovery of the compound microscope, that between this event and the observations of Schleiden and Schwann, and in the third period are grouped the results of investigations up to July, 1878.

In few departments of medicine has original work been prosecuted with as much enthusiasm as in the field of histology. Consequently we expect to find what an examination shows to be true, that the discussion of the third period of our author's division shows the greatest change over the previous edition.

Here we find briefly but clearly given the results of the recent investigations of Frommann (1867-1875), Heitzmann (1873), Strassburger (1876), Flemming (1876), Klein (1878), and others, which demand a total change in the description of the structure of the elementary part of the more complex organisms.

"Henceforward we must describe not only the nucleus but also the cellular substance (protoplasm) as fibrillar in structure, made up of a network of delicate fibres, the meshes of which are filled with an 'interfibrillar' or 'ground substance' which is structureless, and that the fibrillæ of the *intracellular* and *intranuclear* networks are continuous. And if Klein be correct we must define the *nucleoli* as merely local thickenings, natural or artificial, of the *intranuclear* network." (Page 144.)

Owing to the importance of these late observations, Dr. Tyson has appended to the volume, with explanatory text, the essential portions of the plate illustrating Dr. Klein's paper, "Observations on the Structure of Cells and Nuclei," which appeared in the *Quarterly Journal of Microscopical Science*, for July, 1878.

Although our limited space will not admit of any lengthy quotations, we venture to extract the following opinion, coming as it does from so distinguished a microscopist as Dr. Tyson:—

"In *pathological formations* all the different forms of cells here alluded to are met with, and there is now no special type of cell which is known by its shape to have a pathological impression. It is rather by the rapidity of growth of cells, their arrangement and relation to the intercellular substance, as well as peculiarities in the latter substance itself, that we know a structure to be a pathological formation. 'The cancer-cell,' which was so long an object of wonder and fear, and eagerly sought for as such, is no longer acknowledged to be anything peculiar as to form. At the same time, when cells from a suspected growth are observed to be very large, to contain numerous nuclei or centres of bioplasm, and to exhibit great variety in shape, we have evidences of that rapidity of growth which is more or less characteristic of malignant formations." (Page 148.)

In conclusion, the thanks of the profession are due to Dr. Tyson for having rendered accessible information which, until his work appeared, was scattered throughout many volumes. Since a knowledge of the cell underlies any correct understanding of physiological or pathological processes the work under notice deserves a place in the list of authorized college text-books. W. J. C.

ART. XLV.—*A Handbook of Surgical Pathology, for the Use of Students in the Museum of St. Bartholomew's Hospital.* By W. J. WALSHAM, M.B., F.R.C.S., Demonstrator of Anatomy and Operative Surgery at St. Bartholomew's Hospital, etc. 8vo. pp. xii., 449. London: Henry Kimpton, 1878.

WE commend to our Faculties about the end of March the following from the preface to Mr. Walsham's book, and shall be happy when a similar method prevails here. "The method of conducting the pathological part of the examinations at the Royal College of Surgeons of England is to show the candidate a number of specimens of surgical affections; the morbid appearances of which he is expected to recognize, to account for, and to describe."

The book is practically to the surgical portion of St. Bartholomew's Hospital Museum what an explanatory "Guide" is to an Exhibition. No surgical topic is introduced that does not find an illustration in the museum, and yet almost every topic, certainly every one of prominence, is touched upon. Each chapter has a very brief but clear and pointed statement of the pathological process under consideration, and then the illustrative specimens are grouped, and more or less minutely described including their microscopical as well as macroscopical features if needful. For its purpose it is an excellent handbook. We should be very glad if the valuable Mütter Museum at the College of Physicians of Philadelphia had a similar handbook or guide. Practically at present it is of little use, and largely because no one knows what is in it.

W. W. K.

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ART. XLVI.—*On Asthma; its Pathology and Treatment.* By J. B. BERKART, M.D., M.R.C.P.L., Assistant Physician to the City of London Hospital for Diseases of the Chest, etc. etc. 8vo. pp. viii., 264. London: J. & A. Churchill, 1878.

WE were under the impression, before Dr. Berkart's book was placed in our hands, that it was a generally accepted fact that there are a certain number of cases of asthma which can be explained only by assuming that there exists during the paroxysms a spasmodic contraction of the bronchial tubes. Associated with this, it is true, there is generally present, either as cause or effect, some organic disease of the lungs; but, that this is not necessary, is shown by the negative results of *post-mortem* examination in the cases referred to above. The author contends, however, that the starting point of the disease is in every instance an inflammatory lesion of the lungs, and that the reason it is not always detected is the fact that our means of examination are not sufficiently delicate; adding that many cases of bronchitis, emphysema, and heart disease cannot be recognized simply by physical examination. Unquestionably no one knows better than the expert in auscultation the difficulties which occasionally embarrass the diagnosis of all these diseases, but our experience justifies us in saying that cases in which the patient daily expectorates several spittoonfuls of mucus, and in which the most practised and careful observer may fail to detect, by means of percussion and auscultation, the least trace of disease, must be very rare. We should not like, in the face of the author's confident assertion to the contrary, to say that they never occur. We certainly have never met with them, and we fancy that this will be the testimony of most *careful* (provided that they are at the same time *competent*) observers.

In the author's opinion "asthma is," therefore, "only one link in a chain of quasi-independent affections, which commences with inflammatory changes of the pulmonary tissue, and terminates with emphysema or bronchiectasis." These changes in the lungs are necessarily accompanied by destruction of the pulmonary vessels, and secondarily, in consequence of the greater amount of work which the heart is now called upon to perform, in order to force a relatively larger quantity of blood through the contracted lungs, to hypertrophy of that organ. "Under the influence of this increased pressure," the author says, "the pulmonary vessels, unprovided, as they are, with a vascular tonus, readily dilate, and, in order to compensate for the loss of the capillaries, extensive anastomoses form between the pulmonary artery, on the one hand, and the bronchial and pulmonary veins on the other, by means of vascular arches, remarkable on account of their great length, their equable diameter, and their want of branches. The surface of the bronchial mucous membrane then appears studded with granular or villous elevations. On microscopic examination these are found to be vascular papillæ, pyramidal, or club-shaped, consisting of a tortuous vessel, elevated over the surface, and surrounded with connective tissue." If we understand the author correctly, it is the liability of the lung in this condition to become congested, which gives rise to the asthmatic paroxysms. It is difficult, however, to comprehend how this affection of the lung can apparently coexist in the intervals of the paroxysms with perfect health. Take, for instance, the cases, rare indeed, but which nevertheless do occur, in which the patient only suffers from asthma after exposure to the powder of ipecacuanha, while at other times he seems to be entirely free from disease. It seems to us utterly impossible to conceive the existence in these cases of such grave lesions of the lungs.

Entertaining these views of the pathology of asthma, it is not surprising that the author explains the action of certain remedies rather differently from other observers. Ipecacuanha, tartar emetic, and lobelia, in large and nauseating doses, owe their efficacy, he believes, to their power of reducing arterial pressure, and thus of increasing serous exudation; and he explains in the same way the relief which follows the smoking of tobacco and stramonium.

The author seems to us too anxious to establish a theory of the nature of asthma different from that which is generally accepted by pathologists, and which has found favour with such distinguished physicians as Sir Thomas Watson, Hyde Salter, and Bristowe. He does not always, we think, draw the distinction between dyspnoea and asthma quite as sharply as he ought, for we find him alluding to cases of embolism of the pulmonary artery and of plastic bronchitis as if there were danger at the present time of attributing the dyspnoea which arises from these conditions to spasmodic contraction of the bronchial tubes.

J. H. H.

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ART. XLVII.—*A Practical Treatise on Diseases of the Ear, including the Anatomy of the Organ.* By D. B. ST. JOHN ROOSA, M.D., Prof. of Diseases of the Eye and Ear in University of City of New York, etc. Fourth edition. New York: Wm. Wood & Co., 1878.

WHEN the first edition of Dr. Roosa's book was noticed in this Journal in January, 1874, it was predicted that it would at once take its place as a standard authority. That it has done so and that it still maintains this position is fully shown by the present demand for a fourth edition.

The corrections that the author thought necessary, and the additions required

by the progress of otology have been made in the previous editions. "In this edition the chapter upon Diseases of the Internal Ear has been entirely rewritten, and many additions have been made in the discussion of this subject. The remainder of the work remains as in the last impression." The present notice will, therefore, be confined to a few points in this chapter.

Dr. Roosa is inclined to adopt the view of Voltolini, that in many cases that pass for cerebro-spinal meningitis, the seat of the disease is really in the labyrinth. All aural surgeons meet with cases of "nervous deafness," usually in children, which are attributed by parents and family physicians to attacks of cerebro-spinal meningitis, and the question has been raised by Voltolini whether in some at least of these cases the labyrinthine affection is merely a complication of the meningitis, or is itself the primary disease. This is an interesting point in pathology which physicians and aurists must combine to determine, as the specialist usually sees only the result of the disease. There is great need of post-mortem reports of carefully observed cases.

There is an interesting discussion of deafness to certain tones only, double hearing, vertigo, and tinnitus, considered as symptoms of diseases of the internal ear, and of the use of electricity in the diagnosis and treatment of disease of the auditory nerve. The author has not been able to convince himself that electricity is of any great value in the diagnosis and treatment of nervous deafness, and has finally abandoned its use. Most practical surgeons will probably agree with him in this decision as to the present status of this agent, whatever the future may bring forth. It has not even been decided if the acoustic phenomena produced by the galvanic current are due to direct irritation of the auditory nerve, to reflex irritation through the medium of the trigeminus, or to contraction of the small muscles of the ear, and until the whole subject has been brought to a more definite scientific basis than has yet been reached, we are perhaps scarcely in a better position to decide upon it positively and finally than was the old lady, who felt certain that electricity could not be of any use in deafness, because she had been struck by lightning and nearly killed, but it hadn't done her hearing any good.

In regard to the therapeutics of nervous deafness not very much, it must be confessed, is to be said, and the most that can be expected of an author in dealing with it is honesty, for which the reader may give Dr. Roosa full credit. He gives some striking instances of the efficacy of treatment in syphilitic subjects, but admits that all other cases of chronic nervous deafness are utterly hopeless. We believe, however, that no one can read this interesting chapter without feeling that in pathology, at least, the internal ear is not quite the *terra incognita* that it used to be, and that some advances have also been made towards greater certainty in diagnosis.

G. C. H.

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ART. XLVIII.—*Annual Reports of the Supervising Surgeon-General of the Marine Hospital Service of the United States.* For the fiscal years 1876 and 1877. 8vo. pp. 213. Washington, 1878.

FROM this *résumé* of the work performed by this most estimable service we learn that more than fifteen thousand seamen have been relieved during the year ending June 30, 1877, and a somewhat larger number the previous twelve-month. Dr. Woodworth states that no report for 1876 was printed; and therefore includes some of the matter and statistics which should properly have appeared a year ago.

The average cost of the relief afforded, per head, has been pretty steadily



diminishing—owing partly to treatment of many cases as “out-patients,” whereas formerly all were taken into the hospitals—but in part also, we judge, to improved administration under Dr. Woodworth’s supervision. The sum expended for each beneficiary is \$24.22, against \$38.41 the year before re-organization of the service, and \$31.78 the year after (1871). The number of sailors aided has increased since the changes in management—though with some annual fluctuation.

In two points, at least, we find reason to believe that financial economy has not been attained at the expense of humanity; out-patient relief is sought early, by patients who would long and harmfully delay entrance into hospital, which was formerly their only resource; and provision is now made for paying the passage home of foreign sailors who desire to die, or take their chances of recovery, in their own land. It is obvious that both the out-patient and the home-transportation methods may be, when intelligently and humanely administered, as much a kindness to the sailor as a saving to the government. Apart from the natural desire of men to die amid their kindred, no one doubts that the removal of nostalgia often makes all the difference between continued invalidism and recovery.

We find here again urged—“precept upon precept, and line upon line”—the importance of an official medical inspection of all men offering themselves as seamen. Surely, when we consider the conditions attending marine life and investments—how many lives and how much property depend on the absolute efficiency of each man in his place, and the impossibility of replacing the incapable in time of danger—we ought to support Dr. Woodworth and his staff in the effort to make it a matter of course and of certainty that a sea-going crew are all that they profess to be, and not practically twenty or fifty per cent. short of their nominal and required force. And the Marine Hospital Service itself, and the able-bodied sailors who contribute to it a percentage of their hard-earned wages, have also a right to protection against the quartering upon their funds of men who never were fit for duty, or who have undertaken maritime functions after becoming disabled by age or disease.

With regard to this same matter of insuring seaworthiness of men as well as ships, Dr. Baillache supports his Chief, in a paper in which British and other testimony strongly advocates inspection of sailors as well as timbers. He believes ten per cent. to be a small estimate of the loss of life by maritime casualties, due to physical disability of seamen; and thinks the proportion of pecuniary loss due to the same cause about twice as great.

Medical Purveyor and Chief Clerk Oscar Oldberg contributes an article favouring the metric system of weights and measures for all medical and pharmaceutical purposes. In writing prescriptions, he advises, as a precaution against mistakes, during the “transition period,” the use of Arabic numerals *before* the unit of measure, instead of (as ordinarily now) Roman figures *after* the measure; *e. g.*, “Ext. Coloc. Cp. 6 Gm.,” instead of “Ext. Coloc. Cp. ʒiss.” The change of numeral, and the underscoring of the “grammes,” would, he believes, prevent mistaking grains for grammes. It is also suggested as a simpler method in prescribing to use decimal parts of a “gramme,” rather than entire “centigrammes”—as “0.10 Gm.,” in place of “10 centigrammes.”

As to diseases treated by the Service, we find, per thousand cases, “ague,” 150+; remittent fever, 58+; rheumatism, 118; syphilis, 181; bronchitis, 42+; pneumonia, 23; and diarrhoea and dysentery together, about 62. Phthisis appears only as 27+; with pleuritic troubles, 11.

Surgeon Wyman has an instructive paper upon the exposures and resulting diseases connected with the peculiar circumstances of firemen and “roustabouts” on the river steamboats of the South and West. The desire to save time, we are told, leads to the sending of men into boilers while so hot and moist as frequently

to cause syncope. In some cases these exposures seem as wanton and needless as they are inhuman. Many of the persons employed are ignorant negroes, towards whom their employers appear to feel no sort of concern or sense of duty.

Several papers deal with particular epidemics of *yellow fever*, observed by the writers. Dr. Stone saw the disease in Savannah in 1876. Entertaining at first the fullest belief in the uniform exotic origin of this malady, he soon arrived at strong convictions as to the potency and sufficiency of local causes. Certain cases he attributed solely to sewer-poisoning. Of course he also holds decided views as to the preventibility of the disease by sanitary means. If we accept his statements, the conditions as to water-supply, sewerage, and soil-saturation, were certainly very bad at the time.

Ass't Surg. Henry Smith, observing the same epidemic, a little later in the summer, lays little stress on local causes. The spread of the disease he is disposed to attribute to fomites, but not to contagion from person to person. He believed he could trace the extension of this epidemic, at the rate of about forty feet per day, independently of the winds, and as if creeping along the surface of the ground. The temperature of the early summer had been high, and the rainfall excessive. Unlike Ass't Surg. Stone, Dr. Smith holds strongly to the theory of importation—admitting bad sanitary surroundings simply as favouring the spread of the disease.

Reporting concerning yellow fever the following summer in Fernandina, Surgeon Murray states that about three-fourths the whites and half the coloured people were attacked. The mortality in this little town seems to have been strangely low: of 85 African patients not one died. Dr. Murray places great reliance upon quinia and cinchonidia.

In all the papers much stress is laid on the evil influence of filth and bad drainage, on the unusual susceptibility of the coloured people, and on the malarial character or affiliations of the disease, as thus witnessed in these recent epidemics.

B. L. R.

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ART. XLIX.—*Suicide not Evidence of Insanity.* By Hon. O. H. PALMER, of New York. Published by the Mutual Life Insurance Company of New York.

THIS pamphlet of forty pages combats what the author assumes to be a popular error. We are inclined to believe that the tendency, which undoubtedly exists, to give verdicts against insurance companies, is not so much due to any definite belief, as implied in the title of this essay, as to a certain false sentimentalism whose manifestations are daily illustrating the beauties and excellences of jury trials. It is not, we fear, that an average dozen "good men and true" suffer under an error of judgment, as to the relations of suicide to mental soundness, so much as that they catch at any pretext to transfer money from the pocket of an (assumed) "rich corporation" to that of a bereaved and destitute family. Something in the spirit of our times, or in the influences of our institutions, renders the jury conscience very callous to the appeals of abstract right and justice, while very tender to the claims and feelings of individuals or families who are in trouble, without much regard to questions of right and wrong. The judge may expound the law till he is black in the face, but the jury calmly render a verdict according to their impression of what is "about right," with the sublimest disregard for his teachings.

Assuming the general prevalence in America of the belief that suicide is evidence of insanity, Mr. Palmer combats it by citing the habits and customs of

ancient people, and of Oriental nations at present, among whom suicide was and is as far from indicating insanity as is embezzlement in our more favoured age and country. Possibly he is in error in using this argument, since it is probably the especial doctrines and beliefs of Christianity and of modern civilization that render suicide so abhorrent to the mind as to suggest the idea that only the de-throned intellect can adopt it.

Portions of our author's argument are, however, certainly cogent and universally applicable. Some of the finest minds that have adorned European literature in recent times have coolly argued in favour of the right of each man to cut the thread of life whenever existence becomes burdensome. Had they acted on their theory, we doubt if many would have deemed them necessarily insane. The principle of self-sacrifice, too, for country, for loved ones, and for ideas, has not been limited to pagan times and countries. Severe and hopeless suffering, too, seems to us a cause of suicide not necessarily implying madness. With our writer, we are unable to see *presumptive* evidence of lunacy in the suicide of a man who, knowing he must otherwise witness the poverty of his family, or leave them to meet its trials alone, has arranged his life insurance in their favour, and then sought death. Several of the most remarkable cases on record where attempts of this character are believed to have been made, are here very graphically described.

But whatever may be our speculative views as to suicide, it seems to us very unreasonable, in a matter like life insurance, where there are conditions explicitly stated on both sides, to allow a jury coolly to render of no effect an express stipulation, voluntarily assented to by both parties, in order to assist a destitute family at the expense of a company. Why is not the condition as to suicide just as worthy to be enforced as that against foreign travel, dangerous employments, etc. ?

It is, perhaps, a not unnatural error, in writing from the life insurance point of view ; but we cannot but feel that Mr. Palmer makes a great mistake in interpreting general belief by the action of juries. With that exception, the pamphlet is able and well written.

B. L. R.

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ART. L.—*Fifth Annual Report of the Secretary of the State Board of Health of the State of Michigan.* For the fiscal year ending Sept. 30, 1877. Svo., pp. lxxviii., 503. Lansing, 1878.

THERE are a few points in regard to which the Michigan Board need fear no comparisons. Its managers seem to have remarkable tact and facility in so devising and constructing forms and circulars as to reduce to an almost incredible minimum the labour of responding to the inquiries thus made. So cunningly and admirably are their blanks arranged that the busiest or the idlest clerk or physician can hardly plead lack of time as excuse for not filling them. Another matter in which the Board excel, is the preparation of brief tracts for circulation among the people. It may not be very dignified, from a purely literary point of view, to sprinkle one's pages with italics, two or three sizes of capitals, and dozens of catch-words. But to attract the popular attention, to enlighten the popular mind, and to impress upon the popular memory certain all-important facts and principles, the methods here used are admirably adapted. As formal essays for the benefit of sanitarians, the Michigan Health papers may not be quite up to the standard of those of the Massachusetts Board ; but as teaching for the people they seem to us

fully as effective. For an illustration we may refer to the capital papers on the treatment of persons near'y drowned. The clearest and most concise instructions have been printed, on broad sheets, on neat cards, and as pamphlets, and circulated in the most thorough and ingenious manner. In this Report the special aim is to impress the truth that immediate and even rough treatment directed towards clearing the vital organs from water, and the re-establishment of respiration, should forestall coddling. The points are well made, in a way to impress plain people. As an illustration of the necessity of perseverance in attempts to restore respiration, a case is here given where some *six hours* of persistent effort elapsed before "decisive signs of life appeared," and yet recovery was complete. The directions now given, aiming at the economy of precious time, are circulated in the same way as former instructions. Every policeman will see at a glance not only *how* to restore respiration, but the proper order of steps towards the desired end.

Another direction in which the Board has been doing good work, is in the inspection of kerosene oils, and obtaining a law positively prohibiting the use or sale of an article below a certain standard. The almost entire disappearance of the lamp-disasters from the accident lists of the State, attests the efficiency of the efforts made. And moreover, the producers and dealers in kerosene have actually petitioned the Legislature for a removal of the restrictions which have prevented them from murdering the former and legitimate quota—so that the Board is obliged to make a counter-appeal to avoid a return to the good old murderous ways. One lot of oil, marked "Inspected and Approved: Michigan Legal Test, 150°," was suspected by the State inspector, who found that it flashed at 76°; in other words, was about as safe as gunpowder with a lighted candle in it. One can easily believe that this one seizure saved many lives. Experiments have convinced the Board that it is by no means necessary that the body of oil in the lamp be raised to the test temperature, in order to become dangerous. If any metallic portion of the lamp reaches a high degree, it may vapourize the fluid in contact, and this, if mixed with air, becomes an explosive compound. It was found this dangerous heating of the metal part was almost sure to occur upon the removal of the chimney, and liable to follow the turning down of the flame. In one case, after taking off the chimney the collar of the lamp rose in ten minutes from 102° to 163°, while after the resulting explosion the oil was only 80°. The lamp and wick were new and well filled.

Among the more formal essays is an excellent one on *Recreations*, by the Rev. Chas. H. Brigham. Dr. Lyster, writing upon *Healthful Dwellings*, has added to his essay a mass of information as to the homes of the people all over the State.

We learn that during the fiscal year Detroit had 278 cases and 133 deaths from smallpox.

In the diseases prevalent during the year we notice a somewhat remarkable proportion of cases in which typhoid fever is attributed to filth-poisoning, especially in the drinking water, through proximity of wells and privies. A good deal of diphtheria is reported, in apparent relation with the same causes. The occurrence of a case of smallpox in Ypsilanti leads the reporter to remark that this and former cases have been traceable to the foreign rags imported from abroad in bales, and here opened and picked over for use in the paper-mills.

Dr. Lee reports having attended through an attack of erysipelas a half-breed Canadian-Indian midwife, whom he found to have imparted, as soon as she was able after recovery, puerperal fever to five women. He was fortunately able to prevent a continuance of her pestilential labours.

To letters of inquiry concerning diphtheria, which here, as elsewhere, has forced itself into an unhappy prominence, forty-eight answers were received. These form a valuable contribution to our knowledge of the disease, though they are not as yet collated. Nearly all reports mention either polluted wells, foul and wet cellars, no cellars at all, or that the patients lived on the lower story. Often more than one of these conditions were present. It occurs to us, however, that many of the country houses may have only one story, which would add to the apparent, and perhaps the real, influence of this condition.

A still larger number of correspondents deal with scarlet fever, as observed in their neighbourhood. Twenty-nine reporters have met cases in persons over fourteen years of age. In one instance the patient was sixty-five. The average of "greatest age," as reported, is twenty-nine.

Dr. Worsfold suggests means for avoiding the terrible accidents which so frequently occur near our railway centres, from men catching their feet in the angles of the "frogs" and "guard-rails," which form a part of every railway switch. We read only recently of a case in West Philadelphia, where a man was thus caught, and held long enough to be shockingly mangled by the approaching locomotive. A wooden filling, to be so bevelled as to be wider open at top than at bottom, is here described as an efficient and safe device. The suggestion of a possible slight danger of causing the wheels to leave the track is met by the true statement that where some such invention is most needed, in dépôts and car-yards, the speed is too low to cause any risk of leaving the metals. And at points where switches are passed at high speed there is no such number or confusion of trains as to endanger the switch-tender's life, or require such appliances. It is in the making up of trains, and the delicate and rapid manœuvres required to send different arriving cars upon different tracks, that the accidents happen.

B. L. R.

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ART. LI.—*Handbook of the Practice of Medicine*. By M. CHARTERIS, M.D., Professor of Practice of Medicine, Anderson's College, Glasgow. With illustrations. 12mo., pp. 336. Philadelphia: Lindsay & Blakiston, 1878.

THE author of this little book has endeavoured to condense into a duodecimo volume of about 300 pages what Ziemssen has found it impossible to include in the fifteen large octavos in which he at first proposed to issue his work on the Practice of Medicine. If it may be urged against the latter work that many of the articles in it are of unnecessary length and would bear without injury a little judicious pruning, they are at least thoroughly instructive; while, on the other hand, nothing but the most superficial idea of the nature and treatment of disease can be gained from the former. We have looked carefully through it and have found little in it either to praise or to condemn utterly. It is a good representative of its class—as good as any other we know of—but the class is very objectionable, because it has the tendency, we think, to promote laziness in the student and superficiality in the practitioner. Such books seem, however, to command a ready sale, and as long as this is the case we fear they will continue to be written and published.

J. H. H.

# QUARTERLY SUMMARY

## OF THE

### IMPROVEMENTS AND DISCOVERIES

#### IN THE

## MEDICAL SCIENCES.

### ANATOMY AND PHYSIOLOGY.

#### *Case of Absence of the Inter-auricular Septum, without Cyanosis, in a Man aged Forty.*

Dr. RICHARD CATON, in the *Lancet*, August, 1878, p. 252, reports an interesting case illustrating the truth of Stille's observations that complete admixture of arterial and venous blood may take place without cyanosis being present. Many cases have been reported (*vide Medical Digest*, section 763-4), Dr. Caton justly remarks, where, with a large open foramen ovale, no cyanosis existed; but in this case, with greatly dilated auricles, an aperture existed measuring at least three inches in all directions.

August L., a powerfully built muscular man who had had good health all his life, and had been twenty years at sea, was admitted into the Liverpool Northern Hospital on December 10, 1877, suffering from dyspnœa, œdema of the legs, and ascites. Three months previously he had a similar attack. On admission the patient was somewhat cyanosed, and had much cough and expectoration. Pulse 50, intermittent, unequal; temperature, 100°; arteries rigid; cardiac dulness greatly enlarged; sounds normal; veins of the left side of the neck dilated and pulsating, synchronously with cardiac diastole, and filling from below; lungs resonant; expiration prolonged; crepitation at both bases, and *râles* nearly all over; stomach and bowels healthy; urine pale, acid, sp. gr. 1007, no albumen. Rest and milk diet quickly relieved all the symptoms. Towards the close of December he had a relapse, which quickly passed away, and he left the hospital on the 18th of January, 1878, intending to return to work. On the 29th of the month he returned much cyanosed, with great dyspnœa, the lungs being full of crepitant *râles*. On the next day, he fell dead while attempting to get out of bed. A *post-mortem* examination showed the pericardium to be generally adherent; the ventricles, auricles, and appendices were greatly dilated. The pulmonary artery was unusually large, and so were its branches throughout. All the valves were healthy. No communication existed between the aorta and the pulmonary artery. There was no partition between the auricles; a disk of cardboard, three inches in diameter, just fitted the orifice.—*London Med. Record*, Oct. 15, 1878.

*Absence of the Quadratus Femoris.*

Professor WENZEL GRUBER, of St. Petersburg (Virehow's *Archiv für Path. Anat. und Phys.*, Band xxxvii, Heft 3, s. 346, 1878), records the absence of the quadratus femoris muscle in eleven thighs of eight corpses of both sexes. Out of these it was absent thrice on both sides—twice in males, and once in a female subject—and was more often wanting on the left than on the right side. With the absence of the muscle, there was associated in every eleventh case either absence of the gemellus inferior or of both the gemelli; and in one out of five subjects in which this muscle was absent in one thigh, the fellow muscle of the other thigh was abnormally small. In only one thigh, moreover, has Professor Gruber seen a really rudimentary quadratus femoris. In order, finally, to show that Hallet was erroneous in terming the absence of this muscle in man as “Thierbildung,” he asserts that there is no mammal as yet known in which the muscle is constantly absent.

[The above cases appear to point to an opposite conclusion to that which has hitherto been arrived at. Meckel (*Handbuch der Mensch. Anat.*, Bd. ii, s. 552, Halle, 1816), records a case in which, while the muscle in question was absent, the gemelli were unusually strong. With the only instance in which Hallet (*Edin. Med. and Surg. Journ.*, vol. lxi, p. 20, 1848), found the quadratus femoris deficient, out of 105 subjects, there was also an unusual development of the two gemelli and the obturator internus. Theile, too, in the *Encyclopédie Anatomique* (tome iii, p. 279, Paris, 1843), notices the occasional absence of the quadratus femoris in man, and observes that “alors les jumeaux ont plus de volume.” In the *Journ. of Anat. and Phys.* (vol. ix, p. 185), Bellamy records the absence of this muscle on both sides in a female. With this was associated a great and evidently compensatory development of the obturator internus and both gemelli. In a Cape ant-eater, *Orycteropus*, dissected by the reporter, while the quadratus femoris was absent, the gemelli were well developed (*Trans. of Linn. Society*, vol. xxvi, p. 589). Conversely, in a species of Armadillo, *Dasypus sexcinctus*, also dissected by the reporter, this muscle was in a good state of development, but the obturator internus was absent, and the gemelli very small (*Ibid.*, p. 551). Dr. Murie, in his monograph upon the Three-banded Armadillo, *Tolypeutes conurus* (*op. cit.*, vol. xxx, p. 96), states that while there was only “a pair of feeble gemelli,” a “longish goodly sized” quadratus femoris was present. *Rep.*]—*London Med. Record*, Oct. 15, 1878.

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*Innervation of the Uterus and of its Vessels.*

A communication is made in the *Wiener Med. Jahrbucher* by v. BASCH and Hofmann, giving the results of numerous experiments they have performed on dogs. They find that the uterus receives its motor fibres from two sources. On the one hand, from the hypogastric nerves proceeding from the posterior mesenteric ganglion; and, secondly, from nerve-fibres issuing from the sacral plexus. It is well known that Spiegelberg denied any motor power to the hypogastric branches, and Frankenhäuser considered that the sacral branches were destitute of motor power. Now, according to the remarks of v. Basch and Hofmann, a very distinct antagonism exists between these two sets of nerves. If the hypogastric branches be electrically stimulated, contraction of the circular fibres of the uterus takes place, the cervix descends into the vagina, whilst the os opens. On the other hand, on stimulation of the sacral nerves the longitudinal fibres are made to contract, the uterus becomes shorter, and the os remains closed. Suppression of respiration, or stimulation of the sciatic nerve, acts in a reflex manner,

chiefly on the hypogastric nerves. Their experiments further showed that the vessels of the uterus obtain their nerves from the same sources as the muscular tissue, the nervi hypogastrici supplying the constricting and the sacral nerves the dilating fibres, which can likewise be brought into action reflectorally through the sciatics.—*Lancet*, Nov. 16, 1878.

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## MATERIA MEDICA AND THERAPEUTICS.

### *The Action of Arsenic.*

The action of arsenic is a subject for investigation of much importance. Its therapeutic value is so well established as to render it one of the most reliable agents we possess for effecting certain objects. Indications are not wanting that the range of its therapeutical employment may be considerably extended, and there is reason to hope that a more accurate study of its physiological action may render its use more precise in those diseases in which it sometimes does good, but more often fails.

A series of papers have been lately published in *Virchow's Archiv*, which contain an account of an elaborate research into some particulars of its action by Dr. A. LESSER, of Berlin. The first point investigated is its action on the heart of the frog. It is known that the effect of a large dose of arsenic is to retard the action of the heart, and to finally arrest it in diastole. Although the frog lives on for some ten minutes, no stimulus will reawaken the cardiac contraction, even though the heart is excised. Sklarek found nevertheless that the irritability of the muscular tissue of the heart persists, and hence he concluded that the arsenic acts by paralyzing the motor ganglia of the heart. Lesser has observed that the form of the cardiac contraction is changed by the arsenic; the contraction of the ventricle becomes irregular, so that it undergoes peculiar changes of form during its systole. The interval between the contraction of the auricles and of the ventricles becomes unequal, and ultimately that of the auricles ceases long before that of the ventricles. Almost to the last a slight touch on the auricle at the opening of the sinus will provoke a local contraction, and a stronger stimulation one of the whole heart. Hence Lesser infers that the ganglia of Remak lose their irritability before the ganglia of Bidder. This conclusion was in part corroborated by a further series of observations on the isolated ganglia regions, which showed further that the paralysis of the ganglia of Remak is preceded by a transient increase in their irritability, the result of which is, if the heart is separated from the central nervous system, to cause an initial increase in the frequency of its contractions. When its central connections are undisturbed, this increase is not observed, in consequence of the arsenic causing a simultaneous stimulation of the vagus, by which the effect on the ganglia is counteracted. An increase in the frequency of the heart's action has been noted in man as an effect of small doses of arsenic; but doubt has been raised whether it is not of merely psychical origin. This increased frequency of the pulse was, however, found by Lesser to be a constant effect in warm-blooded animals of the intravenous injection of small doses, and he found further that the acceleration is not accompanied by any noteworthy increase in the arterial blood-pressure. Medium doses cause first an increase, and then a decrease in the heart's action, while large doses decrease it from the first. In the latter case the pressure in the aortic system falls immediately, and the more rapidly the larger the dose. If arsenic is injected



subcutaneously the increased frequency of the pulse is a regular though very brief consequence, but otherwise the phenomena agree perfectly with those which follow the injection of arsenic into a vein. The increased frequency of the pulse is found to be the result of two conditions—a diminution of the tonic action of the vagus, and an augmentation of the action of the cardiac ganglia. The diminution in the frequency of the heart's action which is produced by larger doses is due to a depression of the action of the cardiac ganglia, and in some cases an increase in the tonic action of the vagus. In some animals, as in the frog, it was found that the muscular tissue of the heart does not lose its irritability. That of the ends of the vagus in the heart, tested by the electrical stimulation of the trunk of the vagus, is first increased by the action of the arsenic, then is lowered, and finally extinguished. On the other hand, the action of the accelerator nerves of the heart is in no way affected by the arsenic. Nor can any effect be ordinarily traced upon the centre for the vaso-motor nerves, upon those nerves themselves, or upon the muscular tissue of the vessels. For the stimulation of the vaso-motor centre an amount of arsenic is necessary which cannot reach it when the arsenic is injected into a vein; it is necessary to inject it directly into the carotid artery. Even then, however, stimulation of the centre is the only effect; paralysis can never be obtained.

A very marked effect on the adjacent respiratory centre was also observed to be produced by arsenic. It appears to be due in part to the direct action of arsenic upon the centre, and in part to the stimulation by it of the ends of the vagus in the lungs. The direct effect upon the centre is demonstrated by the fact that it is to be observed even after section of the trunks of the vagi; and the effect on the pneumogastric in the lungs is proved by the fact that when these nerves are intact the effect on the respiration is greater than when they are divided. Larger quantities of arsenic extinguish the irritability of the respiratory centre, but less rapidly when the vagi are intact than when they have been previously divided. The initial increase in the respiration is not very great, for the respiratory movements, although increased in frequency, are diminished in extent. A very interesting experiment corroborates the direct action of arsenic upon the centre. A certain strength of the induced current applied to the central end of the right vagus of a rabbit produced constantly a certain acceleration of respiration, never an arrest. Some minutes after the subcutaneous injection of fifteen milligrammes of arsenic per kilogramme of weight of the animal, precisely the same stimulation of the vagus caused an arrest of the respiratory movements, due to tetanus of the inspiratory muscles. Forty minutes later, when the second stage of poisoning had set in, the same mode of stimulation with a much stronger current failed to produce the effect. If the same quantity of arsenious acid is brought into relation with the nerve-centres more rapidly than by the method of subcutaneous injection, the effect is more intense, and of a paralyzing rather than a stimulating character. The diminished action of the respiratory centre occurs immediately after the introduction of the arsenic. The objection may, however, be raised to these experiments that the disturbance of respiration is possibly the consequence of changes in the gaseous contents of the blood, resulting from the retardation of the heart's action and of the movement of the blood. But if the carotid on one side and the jugular on the other be opened immediately after the effects of the poisoning by arsenic are manifest, it will be seen that there is still a marked difference in the colour of the arterial and venous blood; and this, in conjunction with the fact that the heart continues to act strongly for some minutes after the respiratory movements have ceased—as evidenced by a needle through the wall of the thorax, or a manometer introduced into the carotid artery, seems effectually to meet the objection. Hence, although arsenic certainly kills cold-

blooded animals by its action on the heart, it does not, as Sklarek thought, kill warm-blooded animals in the same way, the heart being in them the *ultimum moriens*.

The effect upon the temperature was carefully observed in these experiments. It was found to present a remarkable depression, proportioned in degree to the duration of the intoxication. In one experiment, which lasted 230 minutes, the fall was from  $38.7^{\circ}$  to  $28.9^{\circ}$  Centigrade; in another, lasting 130 minutes, it was from  $38.5^{\circ}$  to  $31.2^{\circ}$ ; and in a third, lasting 52 minutes, from  $39.9^{\circ}$  to  $36.3^{\circ}$ . The fall was more rapid in the first half of the poisoning than in the second. The amount of the arsenic administered had little influence on the rapidity or degree of the depression.

The action of arsenic on the intestinal canal is of considerable importance, on account of the special effect which is produced on these organs in acute poisoning. Peristaltic action is increased, and even a tetanic contraction of certain parts of the intestinal wall, in consequence of the irritation of the ganglia contained in the wall; for either or both of these phenomena may be produced by the local action upon isolated portions of the intestine. The effect occurs immediately after the injection of the poison, and long before any influence on the heart or respiration is produced, and cannot, therefore, be ascribed to the diminution in the amount of oxygen in the blood. Neither section of the vagus nor of the splanchnic nerves has any influence on the result.

Besides this effect on the muscular coat, gastro-enteritis is, as is well known, a constant phenomenon of poisoning by arsenic. Böhm and Unterberger asserted that on this account arsenic is more poisonous when administered by the mouth than when injected into a vein; that the smallest fatal dose by the mouth is not fatal if injected. Lesser is unable to confirm this conclusion. He found it most lethal by injection, as are most poisons. The croupous membrane, which is often present in the stomach and small intestine, was only found when arsenic in the form of powder was given, never when a solution was employed. The false membrane always contains large quantities of crystals of arsenic, whereas they are few or absent in that part of the mucous membrane which is the seat of a simple catarrhal inflammation. Doubt has been thrown by recent observers upon the old opinion that arsenic in the blood is excreted by the intestinal mucous membrane, but this view is confirmed by Lesser, who has found that an appreciable quantity can be extracted from the contents of the alimentary canal, although one which bears a very small proportion to the amount injected, and not enough to account for the inflammation which is found, and which must be due also to the presence of the poison in the vessels and lymphatics of the intestinal wall.

Another point examined by Lesser is the influence of arsenic on the irritability of the striated muscular fibres and of the cerebro-spinal nerves. The method of investigation was by observing the minimum strength of the current required to excite the divided gastrocnemius in two frogs, one poisoned by arsenic, the other unpoisoned. It was found that the arsenic caused a rapid diminution in the nerve irritability, and the fall is greater during the first than during the second half of the toxic period. The effect is not confined to the nerve-trunk, for other experiments seem to show that there is a similar and still more rapid action upon the termination of the nerves in the muscles. From other experiments Lesser infers that the irritability of the muscular fibres themselves is lowered by the poison in just the same manner as that of the nerve, but he does not appear in these to have excluded with sufficient care the possible participation of the intramuscular nerve-filaments. Investigations on the influence of arsenic on the sensitive nerves, and their terminations in the spinal cord, show that immediately

after the injection there is a brief increase in reflex irritability, somewhat later a diminution, and, finally, a disappearance after the arrest of the heart's action. These effects are produced by a direct action on the spinal cord, since they appear at the same time in a leg which is exposed to the action of the poison as in one which is excluded from the action by ligature of the artery.—*Lancet*, Nov. 9, 1878.

#### *Hypnotic Action of Sodium Lactate.*

W. VON BÖTTCHER (*Berliner Klin. Wochenschrift*, 1877, No. 37) states that the effects of lactic acid as an hypnotic were tried upon 60 cases. The dose of the sodium salt varied from 8 to 15 cubic centimetres. Of these 60 cases, 39 gave negative, whilst 21 gave positive results. In 7 of the 21 positive cases, the effect of the lactic acid was to give sound sleep after an hour's interval; in 9 cases the ordinary sleep became deeper, whilst in others again there was an abnormal feeling of fatigue. The action was relatively more certain in young females when administered upon an empty stomach, and in the evening. There was no period of excitation before the advent of sleep, but the after effects upon the digestion were most unpleasant. Lactic acid is, therefore, to be considered as an untrustworthy hypnotic.—*Lond. Med. Record*, Oct. 15, 1878.

#### *Anæsthetic Properties and Mode of Elimination of Iodide of Ethyl.*

M. RABUTEAU, in a note read before the Société de Biologie (*Gazette Médicale de Paris*, October 12, 1878), discusses the anæsthetic properties and mode of elimination of iodide of ethyl. This, the ordinary hydriodic ether, is a colourless liquid of a pleasant ethereal smell, with a piquant taste, which, however, is not caustic, as in the case of chloroform; its density is 1.946. It is readily soluble in alcohol, and in ether, but only very slightly so in water. Mingled with water it falls to the bottom, dissolving so far as to impart its taste and smell to the mixture. It volatilizes readily at the ordinary temperature, producing cold. It boils at 72.2° C. (161.96° Fahr.), but is not inflammable. Iodide of ethyl is rapidly altered by light, becoming brown from liberation of iodine, but it may be again made colourless by shaking it with water which has been rendered feebly alkaline, and afterwards washing with pure water. It is slowly decomposed by the alkalies, and by the oxide and salts of silver. Iodide of ethyl is therefore an unstable ether. The body is formed by the action of hydriodic acid upon ethyl-alcohol, iodide of ethyl and water being formed. Experiments with fowls, frogs, and plants show that iodide of ethyl is an anæsthetic which acts more slowly than bromide of ethyl and chloroform, that its effects are more persistent, that it is broken up in the organism into an iodide which is probably the iodide of sodium, that it is found in the saliva and urine, and that, like bromide of ethyl, chloroform, and ordinary ether, it prevents germination.—*Lond. Med. Record*, Nov. 15, 1878.

#### *Pelletiérine.*

M. DUJARDIN-BEAUMETZ, at the meeting of the Société de Thérapeutique on June 26th (*Gazette Hebdomadaire*), read a paper on the action of "pelletié-rine" when used as an anthelmintic. He showed a tænia which had been expelled after the use of this new alkaloid, which was discovered by Tauret (of Troyes). The dose administered was 57 centigrammes (eight grains) of "pelletié-rine" in 300 grammes of water. In about a quarter of an hour headache and faintness were experienced by the patient; after two hours he took a dose of castor oil, and in the course of the day an entire tænia was passed. Similar results

have been obtained by M. Mollé (of Troyes) and Garnier (of Mans); but MM. Laboulbène and G. Paul did not find it so satisfactory; they, however, only gave from 25 to 30 centigrammes. There is no doubt that it is a powerful anthelmintic; it should be used along with the compound tincture of jalap and the syrup of senna.—*London Med. Record*, Dec. 15, 1878.

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*The Medicinal Uses of Iodoform.*

The numbers of the *Wiener Medizinische Wochenschrift*, 24 to 28 inclusive (1878), contain interesting papers on this subject by Professor MOLESCHOTT, of Turin, Dr. MRACEK, clinical assistant to Professor Sigmund at Vienna, and Professor ZEISSL, of Vienna. Professor Moleschott's paper will be found in full in the current number of the MONTHLY ABSTRACT (page 4).

Dr. Mracek briefly reports the result of the external use of iodoform in Sigmund's clinic during the early part of 1878. It was applied in one of the following forms: One part iodoform to (a) 1 of rectified spirit, and 5 of glycerine; (b) 3 to 4 parts powdered white sugar; (c) 5 parts vaseline; or as collodion (1-10 or 1-15). A small brush was used to spread them; cotton-wool was then laid over the part, and fixed with plaster. The dressing stayed unchanged for from twelve to twenty-four hours. Syphilitic ulcers, hard chancres, swollen inguinal glands, and ulcerating gummata were treated with success. The iodoform causes next to no pain; the sores acquire a clean surface in twenty-four to forty-eight hours, in three to four days granulations are rapidly growing, and within a week cicatrization has set in with remarkable vigour. The antiseptic effect of the iodoform checks all smell from gangrenous sores; and lastly, iodoform does not permanently stain the clothes. Compared with lotions of carbolic acid, salicylic acid, chloral, and astringent preparations of iron, etc., in precisely similar cases, iodoform carries off the palm.

Professor Zeissl especially recommends iodoform as an internal remedy in syphilitic neuralgia, and describes two cases which, resisting all other remedies, yielded only to iodoform. In suppurating glands, with or without sinuses, he is averse to the local application of iodoform for more than a few days; but in torpid ulcers, whether specific or not, he speaks most warmly of its value.—*Med. Times and Gaz.*, Nov. 30, 1878.

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*Effect of Bicarbonate of Potash on the Acidity of Urine.*

Dr. C. H. RALFE, Teacher of Physiological Chemistry in the Medical School, St. George's Hospital, has made some observations (*Lancet*, Nov. 9, 1878) to test the effect of bicarbonate of potash on the reaction of the urine when taken before and when taken after meals.

He found that the effect of bicarbonate of potash, taken after food, on the acidity of the urine, is different from that when it is administered before meals.

For when taken on an empty stomach the acidity on the day of administration was only slightly depressed, whilst on the day following the acidity was considerably higher than it was the day before the salt was taken. But when it was administered during the process of digestion the acidity of the urine entirely disappeared, being on two occasions neutral, and on one alkaline, whilst on the succeeding days there was no marked increase in the acidity of the urine as compared with that of the days preceding the experiment. And the same difference is observable in the hourly variations of the urine, for when the bicarbonate was taken before meals the effect of the alkali passed off at the end of two hours, and the amount of acid passed in the succeeding three hours was nearly equal to what was passed on the day no medicine was taken; whilst when the salt was taken

after meals the urine remained alkaline up to the end of four hours after the dose was taken, and no recovery of acidity was noticeable.

The result of these observations tends to establish the fact that the administration of an alkaline bicarbonate on an empty stomach increases the acidity of the system, whilst its administration after a meal diminishes it.

Dr. Ralfe finds the explanation of this in that the acid reaction of the urine is generally considered due to the decomposition that occurs between an acid or an acid salt and the neutral phosphate of sodium in the blood, acid sodium phosphate being formed, which passes out with the urine. Now, one of the chief acid salts in the blood is undoubtedly bicarbonate of potash or soda, an acid salt with an alkaline reaction. It is, therefore, not surprising to find the administration of an acid salt, if it passes unaltered from the stomach into the blood, causing an increase in the acidity of the urine. And this is, indeed, what happens when a dose of bicarbonate of potash and soda is taken into the stomach before meals, for then, the mucous membrane under normal conditions being either neutral or alkaline, the bicarbonate is absorbed undecomposed into the blood, and causes that increase in the acidity of the urine which has been noted. On the other hand, when the salt is taken during digestion, the acid contents of the stomach decompose it, carbonic acid is liberated which escapes by the mouth, whilst the alkaline bases pass into the system and cause the urine to assume an alkaline reaction.

The therapeutic indications to be drawn from these observations may be thus summarized :—

1. In cases of acid dyspepsia arising from the excessive formation of acid within the system, as in lithæmia, the alkaline bicarbonates should not be administered before food, but after.

2. The administration of alkaline bicarbonates before meals is indicated in those cases where the free acid is formed in the stomach itself, the result of fermentative changes of undigested food or morbid mucus, when it is necessary to diminish the too high degree of acidity thus caused in order to permit digestion to be properly performed.

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## MEDICINE.

### *Scarlatina following Operations.*

The occurrence of scarlatina after surgical operations is a curious fact which merits the attention of pathologists as well as of surgeons. It cannot be regarded as a new observation; for, so far back as 1864, Mr. Maunder raised a discussion at the Pathological Society, by relating two cases in children where the fever had shown itself after the operation of lithotomy; other speakers were also able to narrate similar instances in their own experience. Sir James Paget, in his clinical lectures, devotes a short chapter to the consideration of this point. So far, therefore, as English surgeons are concerned, operative scarlatina is not an unknown complication; but the condition, although not quite ignored by our Continental brethren, was one that, until lately, attracted neither comment nor research; but in a lecture recently delivered at the Hôpital de la Charité in Paris, M. TRÉLAT has rescued it from the oblivion in which it lay in his own country. This eruptive fever, following closely upon operative measures, is exemplified by the citation of some cases that have come under his notice, but not in his hospital wards. The first of these was a young child in whom a small sinus

in the thigh was laid open; the symptoms of scarlet fever appeared within twenty-four hours, and ran their course, but convalescence was extremely slow. The next patient was a young man, aged 17, of scrofulous diathesis, in whose case it was necessary to incise a small abscess in the epididymis, and to aspirate one of larger volume in the supra-pubic region. The patient showed febrile symptoms the next morning, and the following day the scarlatinal rash and sore throat made their appearance. The fever passed through its various phases; but, towards its close, the drainage of the supra-pubic abscess became defective, and an examination of the urine, made at this time, revealed the presence of albumen; but when a ready exit for the pus was effected, the albuminuria disappeared. The third case was that of a soldier, twenty years of age, who received a gunshot injury to the knee-joint during the Franco-Prussian war. Amputation being refused, resection of the joint was accomplished four days after receipt of the wound. Three days afterwards, on account of the high temperature and other signs of fever, the man was considered to be suffering from pyæmia; but a scarlatinal rash making its appearance almost immediately, placed the diagnosis beyond doubt.

This complication to surgical operations seems generally to attack young people and those who have not suffered from scarlet fever previously. It is not necessary for its appearance that an epidemic of the disease should be in force, for, in the last case quoted by M. Trélat, at the time of its occurrence, there was no scarlatina in the ambulance, but within ten days two patients were found affected with this form of fever. That such cases are scarlatinal has been proved by subsequently exposing those who have been attacked to the action of this particular febrile virus, without eliciting any result.

These being the facts, what is the causation of the fever, and why should scarlatina be selected in preference to any of the forms of eruptive fever? If called upon to pronounce an opinion without having previously thought over the subject, we should probably try to escape from the difficulty by either attributing the febrile conditions to septicæmic poisoning, or else by imputing to chance the appearance of scarlatina at this particular juncture; the idea of its having a traumatic origin, owing to some peculiar constitutional condition, does not seem to offer any satisfactory explanation. With regard to the fever being a form of septicæmia, several objections may be adduced: its sudden occurrence without premonitory symptoms (from one to three days is generally the intervening period after an operation), and the appearance of a rash, which is quite distinctive. In his cases, M. Trélat, in order to place this matter beyond doubt, sought in consultation the advice of physicians, and they had no hesitation in proclaiming the eruption to be that of scarlet fever. Septicæmia, according to Verneuil and Tremblay, may exhibit cutaneous manifestations, but the "boiled lobster" state of the patient is unmistakably scarlatinal. Though, at the onset, the eruption is distinctive enough, yet the desquamation in the fever following operations may be abnormal; the presence of the characteristic throat, together with the rash, is a strengthening link in the chain, but the faucial signs may be absent; the same may be said with reference to albuminuria. If it could be proved that no case of scarlet fever was ever found to follow an operation conducted on the principles of Lister, an important step would be gained for or against, as the case might be, the septicæmic theory. In one thing operative scarlatina and septicæmia are alike—both affect the wound and retard its healing.

In considering the appearance of the fever to be a matter of chance, we arrive at an explanation which has before been enunciated, and is accepted by M. Trélat, namely, that the poison of scarlet fever has previously been imbibed by the system, and that the operation, acting as an irritant or influencing unfavourably the

constitution in some other way, causes its manifestation at this particular time, when otherwise it might have passed away, or not have given evidence of its presence until a later date. Sir James Paget inclines to this as the most probable explanation, but at the same time thinks that a surgical operation renders the subject more susceptible to a contagious poison, and that the usual period of incubation in such a case is much lessened. These two hypotheses seem to be the most reasonable of any as yet offered; at all events, both contain a semblance of truth.

The patients of M. Trélat eventually recovered; but several cases with fatal termination have been reported by surgeons in this country; and Sir James Paget offers a valuable suggestion to the effect that the scarlatinal virus, not exhibiting itself, may be the cause of death in children, who succumb within a few days after an operation with obscure and unaccountable symptoms.

In our present state of knowledge, no suggestion can be offered for the reason of scarlatina manifesting itself, instead of chicken-pox, measles, or some other febrile disorder; it can only be said that such is the case as a matter of observation. Puerperal scarlatina bears a marked resemblance to the same exanthema occurring after surgical operations, both in its commencement and in the abnormality of its course. Among obstetricians, differences of opinion still exist as to the pathology of that disease. M. Trélat frankly states that he is ignorant whether there is any intimate relationship between the operation and the fever; and in this respect he does not stand alone. With an eminent authority, we must confess that the question is an important one, both as to the pathology of the disease and the risk of surgery.—*British Medical Journal*, Nov. 9, 1878.

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#### *The Differentiation of Coma from Alcohol.*

Dr. MACEWEN, in opening the winter session of the Glasgow Royal Infirmary School of Medicine, chose for the subject of his address the means of distinguishing the coma produced by alcohol from that produced by apoplexy, opium, and other causes. After alluding to Dr. Richardson's statement that in alcoholic coma the temperature falls, and that this is a distinguishing mark from other forms of coma, Dr. Macewen alleges that he has observed the temperature in a series of cases of fracture of the skull, opium-poisoning, and apoplexy, and that in all these cases the temperature was found very much below the normal. Consequently this point is not to be relied on for purposes of diagnosis. He also controverted the statement that in alcoholic coma there is dilatation of the pupil. He had found contraction the rule. But he had accidentally discovered that if a patient was shaken or disturbed, the pupil dilated, but very soon contracted again. He therefore lays down the rule that an insensible person, who, being left undisturbed for from ten to thirty minutes, has contracted pupils, which dilate on his being shaken, without any return of consciousness, and then contract again, can be labouring under no other state than alcoholic coma. Dr. Macewen's position in the Royal Infirmary of Glasgow gives his observations on this subject much authority. But the test must have a larger trial before it can be finally accepted.—*The Lancet*, Nov. 16, 1878.

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#### *Curare in the Treatment of Epilepsy.*

At the recent meeting of the German Association at Cassell (*Allg. Wien. Med. Zeit.*, October 1), Dr. KUNZE gave an account, in the Section for Internal Medicine, of the trials which he had made of curare in the treatment of epilepsy. Of eighty cases treated, six he regards as cured, the epilepsy having ceased for five years or more. At the very least, then, his remedy has a great advantage over

the bromides, which only postpone the attacks for some half-year. Commencing in his trials of the remedy with doses of a milligramme, and working upwards, he soon found that even large doses could be borne, he remaining with his patients after these were administered in order to observe their effects. The doses to which he did attain would excite surprise. Thus to three grammes of water he added five decigrammes of strychnia, using this for eight injections. The early symptoms of narcosis, such as a little giddiness, and a misty veil before the eyes, passed away in three-quarters of an hour. He soon diminished the above quantity, adding only three decigrammes to five grammes of water and a drop or two of hydrochloric acid, and dividing into eight injections. No symptoms of poisoning were induced in the cases treated; but it is with this remedy as with strychnia, which exerts no influence if noises in the ear are not produced—so here no effect is produced unless there is a veiling of the vision. An important point to note is, that the cases may be divided into two classes as regards this treatment. First, there are those in which there have been only one or two attacks, or in children, in which a single injection may suffice; but, as a rule, a second attack follows in three or four weeks, and then we should observe what time has passed between the injection and the new attack, taking care to make the new injection before the same period of time has again elapsed.—*Med. Times and Gazette*, Nov. 2, 1878.

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*Case of Abscess of the Brain following Otorrhœa.*

In the *Sperimentale* of 1878, Fas. 4, Dr. D. BARDUZZI gives a case of otorrhœa followed by abscess of the brain. It occurred in a boy nine years old, who had been abandoned by his parents and wandered about in great misery. All the history which could be learned was that, three years before, he had received a severe blow on the ear, which had been followed by the issue of purulent matter, and that a few days before the child had been seized with strong fever, vomiting, and delirium. On admission to the hospital he presented the symptoms of typhoid fever of the cerebral type, intense pain, dry skin, temperature from 39° to 41° C., coma, meteorism of the abdomen, muscular contractions, subsultus tendinum, contracted pupil, dulness of intellect, and slow and confused answers. There was very scanty secretion of sero-purulent matter from the right ear; but the importance of this as a clue to the diagnosis was overlooked. The boy died forty-eight hours after admission, and it was only on a *post-mortem* examination that the nature of the case was cleared up. There was found a diffused congestion of the meninges, and a limited abscess in the posterior lobe of the right side of the brain a little larger than a pigeon's egg. The white substance surrounding the abscess was somewhat softened. There was perforation and thickening of the membrana tympani, caries of the upper wall of the auditory canal, and traces of inflammation in the lateral sinus.

Where suppuration is known to exist in the internal ear, Dr. Barduzzi recommends the employment of drainage, either continuous or repeated, thrice a day, and the use of injections of salicylic acid and chloral.—*Brain*, Oct. 1878.

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*Sclerosis of the Spinal Cord, and the Results of Myelitis.*

E. LEYDEN gives, in the *Charité Annalen* for 1878, the results of some experiments on the artificial production of sclerosis of the spinal cord with the view of determining, as far as possible, whether it is to be regarded as a special form of chronic myelitis, and what are its relations to acute myelitis. By injecting a few drops of Fowler's solution into the spinal cord of dogs, he was able to excite violent inflammation. One of the animals operated on survived fourteen months;



notwithstanding total paralysis and contracture of the hind limbs, its general health was good. After the animal was killed, a careful examination was made. The spinal cord at the seat of the operation was very thin, and was covered with a thick layer of fat; in the substance of the anterior cornua of gray matter was a cyst, having its origin in the softening of the tissue; there was also found a focus of rarefied matter, consisting of loose connective tissue with dead nerve-elements; and in the neighbourhood of the focus of softening, in the parts which at the beginning of the process were swollen and infiltrated with cells, was a tough sclerotic network containing only scattered nerve-fibres, without nucleated cells, but with some stellate cells and single nuclei. The muscles of the hind legs were the seat of interstitial fatty growths; the muscular fasciculi had almost disappeared; the motor nerve-roots were atrophied; the degeneration extended upwards in the form of a narrow strip in the posterior column as far as the cervical enlargement. The sclerosis, arising from acute myelitic processes or produced by experiments on animals, corresponds to the sclerosis observed in the human spinal cord, and appears to be an ultimate product of those inflammations of the spinal cord which, without essential destruction, lead to infiltration, and subsequently to atrophy.—*British Medical Journal*, Nov. 9, 1878.

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*Changes in the Sympathetic in Pseudo-Hypertrophic Paralysis and in  
 Progressive Pernicious Anæmia.*

Two cases in which the pathological changes of the sympathetic in these diseases were noted, have been described by Dr. BRIGIDI.

The first case, related in the *Imparziale* for February 28, was one of pseudo-hypertrophic paralysis. The subject, N. N., a man aged 30, and his two brothers, belonged to a poor family, and were obliged to labour at an early age. After some time, they all perceived difficulty in walking; their gait became tottering, and when standing erect they kept their feet wide apart. Two of them died, but of what is not known.

The signs of altered muscular function advanced, and extended to the muscles of every part of the body. As the disease progressed, the patient was obliged to walk with his body bent forward, curved, and his knees bent, his hands resting on his hips. This state continued about two years, during which he visited the hospital twice. On the last occasion, being in Dr. Morelli's ward, he was carefully examined; and some muscles were found to be much wasted, while others were more developed than normal. Electric contractility was weakened, and in certain points destroyed. The muscles of the face alone were healthy. The patient died of a pulmonary affection.

At the necropsy, the voluntary muscles presented the characters of hypermægalia or pseudo-hypertrophic paralysis. On examining the sympathetic, the ganglia, especially the cervical, were found to be a little more coloured than normal. In the cervical and celiac ganglia, the central and peripheral veins were much dilated. The arteries, which were large and empty, were not dilated. The nerve-cells were diminished in number; those nearest the vessels appeared more or less atrophied, and contained many pigment-granules of a deep-red colour inclining to black. There was hyperplasia of the connective tissue, and in some cases true sclerosis. The nerve-fibres containing myelin were few and small. Remak's fibres were indistinct, and in some places were replaced by connective tissue. The veins in the celiac ganglia were less distended; but they presented nuclear proliferations and fatty degeneration.

In *Lo Sperimentale* for May, 1878, Dr. Brigidi publishes an article on the changes in the sympathetic in a case of progressive pernicious anæmia. The subject was a woman, aged 53, who was admitted into the hospital on November 3,

1877, presenting all the symptoms of a well-marked state of chloro-anæmia. In the hospital the patient continued to grow worse, and, without ever presenting fever, and preserving motion, sensation, and intellect throughout, she died on November 12, in spite of the abundant use of tonics and chalybeates, and the administration of meat and wine.

At the necropsy there was found to be extraordinary paleness of the skin, mucous membranes, and almost all the tissues of the different organs. The *panniculus adiposus* was abundant. The cœliac ganglia, examined in the fresh state, showed an abundant proliferation of nuclei, in some parts filling the capsules containing the nerve-cells. These appeared for the most part strongly pigmented; and their protoplasm was so turbid that it was difficult to see the nucleus without employing reagents. The bloodvessels were empty. Subsequent examination of the same ganglia after hardening in alcohol revealed other noteworthy peculiarities. On looking at one of the groups of nerve-cells, there were seen, here and there, parts where the cells were replaced by a considerable number of small globular elements, giving to the tissue the appearance of granulation-tissue. An analogous nuclear proliferation, but less abundant, was observed in other parts of the ganglion, and especially among the nerve-fibres. Those last, and especially the medullated cells, had in large numbers undergone fatty degeneration. In the bloodvessels, the epithelioid lining was much developed and in a state of degeneration; they were empty, and their walls were plaited together; around them was a large zone of fibrillar connective tissue, poor in nuclei, and in some parts connective tissue with narrow meshes formed by the anastomosis of the prolongations of stellate cells.

The author regards the case as one of progressive pernicious anæmia, in consequence of the course of the disease (ascending and slow, never interrupted, and ending in death), of the paleness of the skin and mucous membranes, of the prostration of strength, of the cardiac and gastro-enteric disturbances, and of the appearances at the necropsy; and he explains the connection of the anæmia with the cœliac ganglia as follows.

The changes in the ganglia, by their influence especially in the chylipoietic apparatus, must induce disorder of the circulation in the stomach and intestines, and disturb digestion, the functions of the intestines, and the absorption of chyle. This is a first reason of the dyscrasia of the blood. Secondly, the above-mentioned ganglia exert a retarding action on the heart, and the number of respirations is in strict and direct relation to the cardiac contractions; hence, when once the cœliac ganglia are diseased, there should be a diminished absorption of oxygen—that is, diminished oxidation. Here is the reason why the blood must contain an excess of fatty matters, which are deposited in the tissues that are found to contain them.—*London Med. Record*, Oct. 15, 1878.

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#### *Report on Membranous Croup and Diphtheria.*

At a late meeting of the Royal Medical and Chirurgical Society, Dr. ANDREWS read the report of the scientific committee appointed to examine into the relation existing between the diseases commonly known respectively as membranous croup and diphtheria, of which the following is a summary of conclusions:—

1. Membranous inflammation confined to, or chiefly affecting, the larynx and trachea, may arise from a variety of causes, as follows:—

(a) From the diphtheritic contagion.

(b) By means of foul water, or foul air, or other agents, such as are commonly concerned in the generation or transmission of zymotic disease (though whether as mere carriers of contagion cannot be determined).

(c) As an accompaniment of measles, scarlatina, or typhoid, being associated with these diseases, independently of any ascertainable exposure to the especial diphtheritic infection.

(d) It is stated, on apparently conclusive evidence, although the committee have not had an opportunity in any instance of examining the membrane in question, that membranous inflammation of the larynx and trachea may be produced by various accidental causes of irritation—the inhalation of hot water or steam, the contact of acids, the presence of a foreign body in the larynx, and a cut throat.

2. There is evidence, in cases which have fallen under the observation of members of the committee, and are mentioned in the tables appended, that membranous affection of the larynx and trachea has shortly followed exposure to cold, but their knowledge of the individual cases is not sufficient to exclude the possible intervention, or coexistence, of other causes. The majority of cases of croupal symptoms definitely traceable to cold appear to be of the nature of laryngeal catarrh.

3. Membranous inflammation, chiefly of the larynx and trachea, to which the term “membranous croup” would commonly be applied, may be imparted by an influence, epidemic or of other sort, which in other persons has produced pharyngeal diphtheria.

4. And, conversely, a person suffering with the membranous affection, chiefly of the air-passages, such as would commonly be termed membranous croup, may communicate to another a membranous condition limited to the pharynx and tonsils, which will be commonly regarded as diphtheritic.

It is thus seen that the membranous affection of the larynx may arise in connection with common inflammation, or with specific disorders of several kinds, the most common of which in this relation is that which produces similar changes elsewhere, and is recognized as diphtheria.

In the larger number of cases of membranous affection of the larynx the cause is obscure (*i. e.*, in any given case it is difficult to predicate the particular cause in that case).

Among those in which it is apparent common irritation seldom presents itself as the source of the disease; accidental injury is but very infrequently productive of it. But few cases of undoubted origin from exposure to cold are on record.

On the other hand, in a very large number of cases infective or zymotic influence is to be traced.

The membrane, even when chiefly laryngeal, is more often than not associated with some extent of a similar change in the pharynx or in the tonsils; and whether we have regard to the construction of the membrane, or to the constitutional state as evinced by the presence of albumen in the urine, it is not practicable to show an absolute line of demarcation (save what depends upon the position of the membrane) between the pharyngeal and laryngeal forms of the disease.

The facts before the committee only warrant them in the view that when it obviously occurs from a zymotic cause or distinct infection, and primarily affects the pharynx, constitutional depression is more marked, and albuminuria is more often and more largely present, though in both conditions some albumen in the urine is more frequently present than absent.

The most marked division indicated by the facts before the committee is that between membranous and non-membranous laryngitis.

The committee suggest that the term “croup” be henceforth used wholly as a clinical definition, implying laryngeal obstruction occurring with febrile symp-

toms in children. Their croup may be membranous or not membranous, due to diphtheria or not so.

The term "diphtheria" is the anatomical definition of a zymotic disease, which may or may not be attended with croup.

The committee propose that the term "membranous laryngitis" should be employed, for the avoidance of confusion, whenever the knowledge of the case is such as to allow of its application.—*Lancet*, Oct. 26, 1878.

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*Croup cured by Hypodermic Injection of Sulphate of Atropia.*

Dr. DE PONTÈVES, of Antibes, has published (*L'Union Médicale*) a full account of a case of croup where a fatal termination seemed inevitable, but which resulted in recovery, owing, he believes, to hypodermic injections of sulphate of atropia. On the third day of the attack he found his patient—a child three years old—to whom the usual remedies had been given, in a state of commencing asphyxia. The efforts to breathe could be heard in the street; the epigastrium, instead of rising at each respiration, was hollow; the face and neck were enormously swollen and of a violet colour; there had been no attempt at vomiting, though large doses of sulphate of copper had been given. At once three drops of a one per cent. solution of sulphate of atropine were injected by a Pravaz syringe, on the left side of the neck, on a level with the pneumogastric. At the end of a few minutes a change for the better took place, the respiration became less frequent, and the crowing diminished. Four hours afterwards the child was found tranquil, and, though the respiration was still troubled, dyspnœa was no longer intense. A second injection was given and the amelioration shortly afterwards became very marked. A few days afterwards the recovery was complete. *A priori* the treatment is a rational one. The real cause of death in croup does not reside in the false membranes. M. Jaccoud, in his *Traité de Physiologie Interne*, speaks of the "very numerous cases in which croup kills without laryngeal obstruction sufficient to explain death." He adds that, "though often the expulsion of the false membrane is followed by great relief marking the diminution of the dyspnœa, yet the cases are far from rare in which the remission is absent or inappreciable—a fact sufficient to prove that croupal dyspnœa has more causes than the obstruction of the larynx by exudation." When the pneumogastric nerves of dogs are divided in the neck, what always happens is the occlusion of the glottis from paralysis of the recurrensts, and after death there is found intense congestion of the lungs, pulmonary œdema, dilatation of the smaller bronchi, and vesicular emphysema. Now these symptoms and lesions are also observable in croup and capillary bronchitis. The essential cause, therefore, of asphyxia in croup seems to be the paralysis—more or less complete—of the pneumogastric. This view is supported by the fact that it is difficult, and often impossible, to produce vomiting. Belladonna, being an excitant specially of the pneumogastric, appears to be indicated in cases such as have been detailed.—*Dublin Journal of Med. Science*, Nov. 1875.

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*Lesions of Salivary Glands in Diphtheria.*

In a paper recently contributed to the *Revue Mensuelle* MM. BALZER and TALAMON describe certain inflammatory changes in the parotid and submaxillary glands as almost constant concomitants of pharyngeal diphtheria. They remark that these changes have been strangely overlooked; for, although indicated by Dr. Samuel Bard, of New York, so long ago as 1771, in his work "On the Nature, Cause, and Treatment of Suffocative Angina," as occurring in some cases, yet Bretonneau and all succeeding authorities have considered that when

Bard spoke of swelling of the "parotic and sublingual glands," he was confounding them with the lymphatic enlargements which are a constant feature of the disease. Seeing how frequently the salivary glands, especially the parotid, became affected in infectious diseases, and noticing also that the peculiar aspect of the tumefaction beneath and behind the jaws in diphtheria was not explained on the ground of lymphatic inflammation alone, MM. Balzer and Talamon determined to investigate the condition of the salivary glands in this disease, and with the result of showing that Bard was right. Thus, after the lapse of more than a century, has a clinical observation been confirmed by pathological research.

The morbid changes noted by Balzer and Talamon concern both the cells of the glandular epithelium and the interacinous connective tissue. The former, in the slighter cases, are swollen and filled with homogeneous translucent mucoid material, and the cells of Gianuzzi are more numerous than normal. More often the acini are diminished in size, their cells small and glandular, presenting the appearances shown by Ranvier to exist after prolonged excitation of the nerves going to the gland. In other parts the acini are filled with small round cells, the glandular structure almost disappearing, and when this alteration is most extreme the accumulation of leucocytes is sufficient to form small abscesses. There is similar infiltration of the connective tissues within the lobules and acini, but less change in the perilobular and periglandular tissue. The lymphatics within the gland are stuffed with round cells, and often form small abscesses around the lobular ducts. The larger ducts show but little change, but this does not negative the idea that the inflammatory lesions commenced in them, or rather travelled down them to the glandular substance. These changes were found in all the cases of diphtheria examined, without regard to the mode in which death had occurred. Applying these facts to those observed at the bedside, they point out that quite early in the disease there is swelling of the neck beneath the jaw as well as behind its angle. The swelling in the latter situation, and extending along the border of the sterno-mastoid, is due largely to enlargement of the chain of lymphatic glands, which receive their lymphatics from the palate, uvula, and tonsils. Part of the swelling may, however, be due to parotitis, and often there is, in addition, some œdema of the surrounding connective tissue. The submental enlargement is solely due to the inflamed submaxillary gland. It is not dependent on enlargement of the lymphatic glands lying here, for not only do they not receive lymphatics from the parts affected by the diphtheritic inflammation, but after death these lymphatic glands are barely if at all enlarged. The same argument applies to the view that the swelling in the parotid region is due to lymphatic and not salivary gland inflammation, for here also no lymphatic vessels pass from the pharyngeal region. They hold, then, that there are three factors in the production of the swelling of the neck in diphtheria: firstly, lymphadenitis, leading to the painful, small, hard tumours behind the angle of the jaw and along the sterno-mastoid; secondly, inflammation of the salivary glands, producing the uniform, smooth, elongated swelling beneath the lower border of the jaw, and that which fills up the hollow immediately behind the ramus; and lastly, the general swelling of the hyoidean region, due to inflammatory œdema, of the cellular tissue. Whether the inflammation of the salivary glands is primary or secondary to lymphatic inflammation they give no definite opinion; but owing to the very early appearance of the swollen submaxillary glands, they do not think it due to the general blood-condition, as in the parotitis of specific fevers.—*Lancet*, October 19, 1878.

*Dyspnœa in Acute Pleurisy.*

Dr. DIEULAFOY takes the occasion of two cases (which have recently come under his notice at the Charité) of pleurisy with effusion (*Gaz. Hebdom.*, September 27), for making some observations on dyspnœa as observed in this affection. It is generally believed, he says, that dyspnœa is one of the most common symptoms observed in pleurisy with effusion; and certainly, at first sight, it seems quite natural, when two litres of liquid exist in the chest, when the lung is flattened and thrust back by the effusion, and when hæmatisation is only imperfect, that the breathing should be oppressed. And yet such oppression does not exist, or only to an insignificant extent. Effusion, when it amounts to a very large quantity, impedes respiration but slightly, so that *dyspnœa is not to be regarded as an habitual symptom of pleurisy with effusion*. This is a point of great practical interest in relation to the indications of thoracentesis.

A medical student at the Charité observed his breath to be a little short, but to so slight an extent that he pursued his studies at the hospital as usual, and it was almost by accident that his chest was examined, and found to contain more than two litres of liquid. His health was excellent, and he only felt somewhat out of breath when he walked quickly or ran upstairs. Respiration was only 21 in place of the normal 16 or 18. Dr. Dieulafoy practised two aspirations, at intervals of two days, only removing, according to his usual practice, a litre of fluid at each, leaving the remainder, which was absorbed in a few days. The second case occurred in the person of a man-servant who had suffered from a left pleurisy for nine months, during which period eighteen blisters had been applied without effecting a cure. After the acute stage had passed away, for which he had kept his bed, he resumed his duties, but found his respiration still somewhat embarrassed. Still the oppression was very tolerable, as it allowed him to continue the hard work of polishing the floor daily, and sometimes ascending the box of the carriage. He spoke at all times with an ease and vivacity that conveyed no idea of a person suffering from dyspnœa. And yet, on examining his chest, Dr. Dieulafoy found an amount of effusion such as he had never met with before—the heart beating beyond the right nipple, almost in the right axilla, the right lung being to some extent also thrust backwards. After the examination of the chest the quantity of liquid was estimated at five litres, and after so long a sojourn it must have become hæmatic or purulent. But when the liquid becomes purulent in chronic pleurisy, the general symptoms are habitually marked, the patient losing his appetite, becoming thin, with shivering and sweating and febrile elevation of temperature, especially at night. Nothing of this sort was observed in this patient, who had a good appetite and no fever, and was polishing floors until the day before admission. At the examination his respirations only amounted to 27, a much inferior number to that furnished by bronchitis, pulmonary congestion, or the smallest nucleus of a pneumonia. On a puncture being made in order to withdraw the first litre, a thick layer of false membranes had to be traversed, and the liquid withdrawn was hæmatic.

Many other examples might be cited, and among these the case of a person who believed himself to be cured of a pleurisy of three weeks' standing. So little was his respiration embarrassed, that the respirations were only twenty-two, and yet paracentesis, practised three times, withdrew three litres of liquid. This want of accordance between the dyspnœa and the effusion has often been noted, but it has been perhaps too much regarded as an exception, while it would seem to be the rule. Among several examples, Trousseau relates that a nurse came four kilometres on foot to the Necker, carrying her child, without seeming to be much fatigued; and yet on paracentesis being performed, 2500 grammes of fluid

were withdrawn. Similar cases are related by Andral and Laudouzy; and it is a fact that even abundant effusions in general only induce but an insignificant amount of oppression—a fact which there is too much tendency to forget when it is sought to make dyspnœa the principal indication for paracentesis. It may be objected that there are patients who, from the very commencement of the pleurisy, and with but little effusion, yet exhibit considerable dyspnœa. This is only a misunderstanding of the term. At the commencement of a pleurisy, in fact, and during the sometimes so painful early stage, when the pain in the side (*point de côté*) is so acute, the patient may have short, interrupted, and jerking respiration, and he is said to have dyspnœa. His breathing is indeed difficult, but it is difficult and impeded only because it is painful, effusion having nothing to do with it, as it does not yet exist. This dyspnœa at the commencement, then, is a false dyspnœa, and is not due, like true dyspnœa, to defective and insufficient hæmotosis, but to the pain which limits the respiratory movements and destroys their normal rhythm. The proof of this is that the breathing becomes easier in proportion as the pain disappears, although the effusion is making incessant progress; and it is often when the liquid has reached its apogee, attaining two or three litres, that the patient believes himself cured, because he is then free of fever and of pain. During the acute stage of pleurisy, also, febrile action accelerates the respiration; for whatever may be the cause of fever, it renders combustion active, and consequently accelerates the respiratory rhythm. But fever is in general very moderate in pleurisy, and exerts but a slight effect on the respiration. Nevertheless, both pain and fever are two of the elements of pleurisy which, by a different mechanism, may engender disturbance of the respiration; but when these two elements have disappeared, or have not existed (as in certain subacute pleurisies termed latent), the patient has no dyspnœa, notwithstanding the large accumulation in his pleura. He certainly is not able to make the same exertions as a man in good health; but when he is in bed, and in the repose which any patient must be in order to undergo a medical examination, the dyspnœa is so insignificant that it ought not to be regarded as an element of diagnosis, and should not be accepted as an indication for paracentesis.

This association between a large effusion and an almost normal respiration, which at first seems so strange, is not difficult of explanation. In the physiological condition respiration is not exerted alike over the whole pulmonary surface, certain parts of the lung, especially the superior lobes, contributing but very little to the function. But in a pathological condition, when the play of the lung is impeded by the presence of an effusion, the healthy lung comes into action through its whole extent, and nearly re-establishes the equilibrium in the phenomenon of hæmotosis.

The first consequence which results from this absence of dyspnœa in pleuritic effusion is that dyspnœa furnishes only insufficient or unsafe indications when an operation has to be decided upon. To delay evacuating the pleura until the patient is attacked by dyspnœa is to wait until the effusion has attained proportions so considerable that the life of the patient has already been long in danger by the time the decision is arrived at. All the cases in which sudden or rapid death has occurred during the course of a pleurisy with effusion are neither known nor published, but those which have been published show us that the patients generally die on account of cardiac coagula, coagula of the pulmonary arteries, and thrombosis favoured by the entirely mechanical conditions of displacement, torsion, and flattening of vessels, and of the obstructed circulation due to the effusion. Another consequence arising from this absence of dyspnœa is, that when it is present in pleurisy it is a sign of a complication; so that whenever a patient, the subject of pleurisy with effusion, presents more than from twenty-eight to thirty respira-

tions per minute, we know that we have something besides a pleurisy to deal with. If careful examination be made it will be found that the pleurisy is secondary, developed in the course of Bright's disease, or of a cardiac affection with congestion of the lung; or the pleurisy is associated with other diseases, as double pleurisy, bronchitis, pneumonia, pericarditis, fluxion of the chest, or pulmonary congestion.

"To sum up—1. Dyspnœa is not one of the habitual symptoms of pleurisy with effusion. Pleural effusions, even when they reach 1800 grammes or two

litres, only accelerate the respiratory distress, and do not produce a permanent dyspnœa. 2. In the pyrexial period which is often accompanied by false dyspnœa, and I make reserves in the cases in which fever is still vivid. But under all other circumstances, in the apyretic phase of pleurisy, and subacute, latent, and chronic pleurisy, dyspnœa is a symptom so *anodin* that it does not merit being taken into consideration in reference to diagnosis, prognosis, or treatment. 3. On the other hand, when a true dyspnœa is proved to exist during the course of a pleurisy, we must always be on our guard against a complication, whether the pleurisy be secondary (as in Bright's disease or affection of the heart), or whether it be associated with other phlegmasiæ or pulmonary congestion."—*Med. Times and Gazette*, Oct. 12, 1878.

### *Syphilitic Phthisis.*

Dr. A. FOURNIER communicated to the Académie de Médecine (*Gaz. Méd.*, November 23) a case of tertiary phagedæna of the foot, and syphilitic phthisis. The seat of the phagedæna is in the highest degree unusual, and the simulation of ordinary phthisis was remarkable. When the woman entered the hospital, the lesion of the foot had already destroyed the second and third toes and a part of the fourth, and her general aspect was that of extreme cachexia. She had coughed and expectorated during several months, and the examination of the chest revealed advanced lesions. All the ordinary symptoms of pulmonary consumption were present—this being the essential characteristic of the case. But before long, under the employment of a specific treatment for the phagedæna, improvement began to take place, and gradually her cure became complete.

Dr. Fournier observes—1. Such is the well-known frequency with which tuberculosis occupies the apex of the lung, that any lesion of this organ that is so localized is immediately, from this very fact, set down as ordinary phthisis. This generalization is, to say the least, excessive; for syphilis—to speak only of it—may, like tubercle, occupy this seat; and when it effects a lodgment there it assumes the mask of phthisis, and may thus give rise to error. 2. What is no less true, is that every pulmonary lesion accompanied by general symptoms gives rise to a suspicion of tuberculosis; and a patient with such lesion, who wastes away, is at once pronounced a subject of phthisis. This is another hasty generalization, for pulmonary lesions having a syphilitic origin will be attended by the same symptoms. Most positively there is a pulmonary consumption of a syphilitic nature—a syphilitic phthisis entirely comparable with the phthisis of tuberculosis. 3. This patient has owed her recovery entirely to the phagedæna of the foot, which has saved her; for it was solely in reference to this lesion that the specific treatment was resorted to. Without this she would certainly have died, for there was no other indication for specific treatment, and the ordinary treatment of phthisis would have been for her a sentence of death. 4. The most curious point about the case is the fact of the cure having been obtained amidst conditions to all appearance most deplorable. When she was admitted no one would have believed that she would quit the hospital except for the dead-house;



and yet she was dismissed cured of the phagedæna, of the lesion of the lung, and of the cachexia. This proves that syphilitic lesions of the lungs, far from being curable only in their early period, and in their benign forms, are so even in their most advanced stages and menacing forms—even after extensive infiltration, softening, or the formation of cavities has taken place, and when the general symptoms present themselves under all the aspects of true phthisis. They may, in fact, be cured, as in this case, contrary to all expectation, in patients who are exhausted, etiolated, and cachectic in the strongest sense of the word.—*Med. Times and Gaz.*, Nov. 30, 1878.

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*The Treatment of Thoracic Aneurism.*

In an article contributed to a recent number of the *Revue Mensuelle de Médecine et de Chirurgie*, Dr. DRESCHFELD, of Manchester, deals with the three chief methods of treatment of aortic aneurism—viz., that by the administration of iodide of potassium, that of restricted diet and enforced rest in the horizontal position, and that of galvano-puncture. He prefaces his record of six cases in which some or all of these agents were employed by a slight sketch of each method and its *rationale*. He bears strong testimony to the efficacy of the iodide, first introduced by Bouillaud, and since warmly advocated by Balfour and others, but admits that it is not positively known how it acts. It probably slows and diminishes the action of the heart and the arterial pressure—an effect due rather to the iodine in the salt than to the potassium. Large doses (he advises small doses to commence with, and their increase up to six grammes or more), long continued, often give good results, especially in old subjects, and when the aneurism is of recent formation and small in size. Of the second plan—best known as Tufnell's treatment—that of absolute recumbency and a restricted non-liquid diet, Dr. Dreschfeld states that in nearly all the cases he has employed it the pulse-rate has been much diminished. Galvano-puncture, however, is the most certain in its effects of all the methods, since it promotes coagulation in a threefold manner: chemically, by the electrolytic decomposition of the water and salts of the blood; mechanically, by the inserted needles acting as foreign bodies; and, thirdly, by acting as an irritant and exciting inflammation of the wall of the aneurism. The ill results that sometimes, but rarely, happen from its use, he believes to be preventable, and he has never seen any embolism occur from detachment of clot formed during the procedure. The currents employed should be of weak intensity, and the time during which they should be allowed to pass ought to be at least thirty minutes. The needles should be of steel, and should be long and fine, well-pointed and polished, and coated with insulating material, such as varnish or gum, except at the points. Two or three may be inserted, not too close together; and it is best to connect them with the positive pole, the negative electrode being a moistened sponge applied to the skin in the neighbourhood of the tumour. In one case, however, the needles were attached to the negative pole, and with good result. The number of elements employed should be at first small, and should then be gradually increased at intervals of five minutes; and he allows three or four weeks to elapse before repeating the operation. Details of six cases are then given. The first, an extensive fusiform aneurism of the ascending aorta in a gardener thirty-eight years of age, was first treated with the iodide, and three weeks later by galvano-puncture, the negative pole being in the sac, and the number of elements (Weiss) increased from five to fifteen. The operation was followed by marked improvement, and was once repeated. The patient lived for nearly four years, pursuing his ordinary avocations, and the sac of the aneurism was found to be largely occupied by a thick firm material resembling embryonic fibrous tissue. In the second case, also of

the ascending aorta, much relief was produced by the iodide and by rest, but the patient died soon after from an intercurrent attack of pericarditis and pneumonia. In the third case all three methods were had recourse to, and galvano-puncture was thrice performed, the needles being connected with the positive pole. The number of elements ranged from three to twenty-two, and each operation lasted about an hour and a half. The tumour, which was of the size of a small apple, ceased to pulsate, and became firm, remaining so six months afterwards, when the patient, a female forty-four years of age, was last seen. The fourth case was one of a very formidable character, the aneurism almost filling the left half of the thorax, and being on the point of rupture. In spite of iodide of potassium, morphia, and the application of ice, it continued to increase; and a week after admission galvano-puncture was had recourse to. The needles connected with the positive pole were inserted, five to twenty-nine elements used, and the operation continued for two hours. It was repeated again a month later, when four needles were used, and the current allowed to pass for three hours; and again about three weeks afterwards, when the operation lasted four hours. A fourth galvano-puncture was made within three weeks from the third; but death occurred ten days later. In the remaining two cases, the iodide and Tufnell's treatment were employed; in one with great amelioration. Dr. Dreschfeld thinks these cases show the advisability of combining, as far as possible, all three methods of treatment, employing first the medicinal, dietetic, and postural methods, before having recourse to galvano-puncture, which should, however, in no case be long delayed. He has seen no benefit from the subcutaneous injection of ergotin, and thinks ligation of the carotid should be restricted to cases of innominate aneurism.—*Lancet*, Oct. 12, 1878.

#### *Chloride of Ammonium in Hepatic Diseases.*

Dr. WILLIAM STEWART adduces fresh instances of the vast value of this agent in diseases of the liver, in the *British Medical Journal*, September, 1878, p. 467. It was in the year 1870 that Dr. Stewart first drew attention to the use of chloride of ammonium in diseases of the liver, as met with in the tropics; and subsequent papers have explained the general and special action of the drug on the congested or inflamed liver.

The following remarkable train of effects follows the ingestion of a twenty-grain dose, the only contra-indication for its use being a dry and hot skin; under which circumstances some simple diaphoretic ought to precede its administration. As a general rule, about fifteen minutes after taking the medicine, the patient experiences a sensation of warmth in the epigastrium, which by and by extends, pervading the abdomen, and gradually becomes diffused over the entire cutaneous surface. The nervous system becomes exhilarated, the circulation excited, the patient feeling light-headed or possibly drowsy. Acute pain, previously felt in the hepatic region, is either entirely removed, or, in its place, pain is referred to the axillary region, where it was not previously complained of; the patient now often falls asleep, and shortly a full and free perspiration breaks out, lasting one or two hours. Again the pain returns to its original position, but mitigated; and with the next dose of the medicine, at the expiration of six or eight hours, similar phenomena result. After several doses the urine becomes very abundant, the appetite is much improved, and the hepatic mischief vanishes. Sometimes after taking the chloride (in five minutes to half an hour) a peculiar sensation may be felt in the hepatic region, variously described by patients as a "shock," "pulling," "pins and needles," a "clawing," "working," or "gnawing sensation," none of which are to be interpreted as the medicine disagreeing, but the

contrary. Dr. Stewart congratulates the profession that the brilliant results following the use of chloride of ammonium, both in this country and abroad, are becoming more generally recognized. Dr. Murchison, in the second edition of his work upon *Disease of the Liver*, 1877, p. 624, thus speaks of the drug: "The chloride of ammonium holds a pre-eminent place" among remedies for functional disorders of the liver, "being of great service in the functional derangement of the liver attended by lithæmia."—*London Med. Record*, Nov. 15, 1878.

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*On the Oleate of Zinc in the Treatment of Eczema.*

Dr. H. RADCLIFFE CROCKER, Assistant Medical Officer in the Skin Department University College Hospital, calls attention (*Brit. Med. Journ.*, Oct. 26, 1878) to the value of oleate of zinc in eczema. It is prepared by stirring together one part by weight of oxide of zinc with eight fluidounces of oleic acid as free from palmitic acid as possible, and, after letting it stand for two hours, heating it until the zinc is completely dissolved. On cooling, it forms a yellowish-white hard mass, which can be made into the consistence of ointment by the addition of one part of vaseline or olive-oil, or two parts of lard or simple ointment. Vaseline is preferable, as it is not liable to change. The other preparations, soon becoming rancid, should be freshly made, and then answer equally well and are much more economical. Mr. Martindale has also spread it on thin paper, which is a convenient way of applying in some cases.

The above preparations Dr. Crocker has found very effectual in acute and chronic eczema in the discharging stage. In the dry stage, it is also useful; but in many cases more stimulant remedies cure more speedily. The two following will show its mode of application and its merits, and are chosen as being the first two in-patients on whom it was tried, while the extent and duration of the disease were sufficient tests of its value.

CASE I. O. N., a boy aged 7, was admitted into University College Hospital on May 7th, under Dr. Tilbury Fox, with a history of having been treated in a provincial hospital for twelve months for general eczema with only slight benefit. How long he had been suffering before this was not ascertained. On admission, the face, neck, and scalp were covered with pustular eczema. Thick yellowish crusts, with copious purulent discharge, were present in these situations; and the eyes were nearly closed by discharge and swelling. Both buttocks, thighs, and legs were also affected; and there were a few patches on the trunk. The discharge was free, but not purulent in these parts. The following treatment was employed: The hair was cut off, and the parts soaked in olive-oil all night to soften the crusts, which were then bathed off with warm water. On May 8th, the oleate of zinc ointment, made with lard, was spread upon linen rags and applied closely by means of a bandage; the parts were kept constantly moist with the ointment; new crusts were removed as fast as they formed; and every day all the old ointment was wiped off before fresh was put on. A drachm and a half of "Parrish's food" and a drachm of cod-liver oil twice a day were also ordered.

May 13th. Great improvement was manifested. The discharge and scabbing were much less. He continued to improve; and on May 27th it was noted that the face, scalp, and neck were now almost clean, with only slight discharge; while the buttocks and legs were quite dry. On June 2d, there was no discharge anywhere, and only patches of diseased surface were left, with thin dry scales; and thymol (five grains to the ounce of ointment) was then added. On June 13th, he was discharged well, with no trace of eczema anywhere, and the general health much improved.

CASE II. A boy aged 10 had chronic eczema on the thighs and legs for two years. The medical man who sent him wrote: "He has been to all the surgeons in the neighbourhood, and no one appears to do him any good." He was admitted on May 23d. Similar treatment to that of the first case was employed, and he also was discharged cured on June 13th.

In addition to the above, Dr. Crocker has treated more than twenty out-patients during the last six weeks with this remedy. Six have been quite cured, and the rest are still under treatment; but all are improving—some very rapidly—in spite of the disadvantages attending out-patient treatment, owing to imperfect removal of crusts, the intermittent application of the dressings, etc.

The oleate of zinc ointment is a remedy of the same class as Hebra's unguentum diachyli; and, while beneficial in all forms of eczema, its most striking effects are seen in the discharging stage, and, so far as Dr. Crocker's experience has gone, it never seems to do harm in any case, as happens when stimulating remedies are injudiciously applied.

Since writing the above, three months ago, Dr. Crocker has treated a large number of cases with this remedy, with most satisfactory results, so that he can with confidence recommend it as one of the most useful preparations for eczema that we possess.

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#### *Inflammatory Fungoid Neoplasm.*

At the late meeting of the American Dermatological Association (*Archives of Dermatology*, Oct. 1878) Dr. DUHRING, of Philadelphia, reported a case of this. The first affection of the skin from which the patient (a married lady of fifty-eight) ever suffered was an acute attack of what seemed to have been vesicular eczema, in August, 1876. This was followed by repeated attacks of urticaria, showing excessive irritability of the skin; and in October of the same year the first manifestation of the present disease made its appearance. This was a red spot on the right side of the forehead, of the size of a dime, not inflammatory, and looking like a superficial burn.

It gradually increased in size, and in August, 1877, began to rise slowly above the level of the skin, when it assumed a purplish hue, and presented the appearance of a boil. There were no subjective symptoms. Later, a number of tumours, of various character and sizes, appeared on the forehead, scalp and face, and also upon the trunk and extremities, most of them coming very suddenly, and some of them disappearing almost as rapidly. Later, some of them gave rise to considerable pain, and also to intense itching. In one day nine new, small tumours came upon the scalp, they were like gristle to the touch, freely movable, and soon disappeared; also there appeared, without her knowing when, tumours upon her buttocks and back.

Dr. Duhring saw her first October 25, 1877. The previous history, as given by patient, Dr. D. thinks reliable, she being a remarkably intelligent woman. When seen by Dr. D. the lesion involving the right side of the forehead (the original lesion), was of the size of a half cherry, of a raspberry colour, tense, containing no pus, tuberculated and furrowed. Inside of right arm was an oval patch, dull red in colour. The natural lines of the skin were exaggerated. There was another tumour in the posterior fold of right axilla. Several patches were upon the abdomen. There was a patch in the groin half an inch in height, shape of a hen's egg, and smooth. There was much dusky yellow pigmentation. On October 26th Dr. Duhring observed a new lesion that had appeared since the night before. It was near the nipple, olive-shaped, rough, of a deep pinkish colour, soft and supple—not inflammatory, not changing colour on pressure. It was evident that while tumours were continually appearing, they were almost as

rapidly disappearing. Some were persistent, as those upon forehead. Some lesions grew with great rapidity. The growths extended over forehead, eyebrow, and scalp, both flat and tuberculated. Some of the patches disappeared as rapidly in a few days. One tumour upon the left cheek softened and suppurated. This tumour, after it had existed three months, was excised. Its cut surface was grayish yellow, and firm, like sarcoma. Its weight was one ounce.

Under the microscope ( $\times 300$ ), specimens of integument from them presented the following characters: The whole of the corium was infiltrated with a new growth, the cells being more abundant in its deeper portions. The walls of the hair-follicles were also packed with neoplasm. The cells were homogeneous in character, not being nucleated, as a rule. Some of them, however, had nuclei. There were but few spindle-cells, as far as could be seen; nor was the connective tissue or elastic-fibre bundles conspicuous.

New developments continued to manifest themselves from time to time, and on July 2, 1878, Dr. Duhring strangulated a large tumour on the left cheek with a ligature. On July 4th ablation was performed, and this was followed by severe hemorrhage; but the operation finally resulted in the most successful manner. This tumour was presented to the Association, and although it had been kept in alcohol, it was still of the size of a very large horse-chestnut. It weighed one ounce when first removed. Before this time the internal administration of iodide of sodium, and later of arsenic, had been tried; but instead of being of any service, they both seemed to greatly aggravate the disease.

Dr. Duhring regarded the affection not only as new, but of such a grave character as to make it deserving of the closest study. Its course seemed entirely at variance with the ordinary manifestations of disease, and the fact that the general health remained unimpaired seemed to indicate that it was confined exclusively to the integument. There were two principal lesions—the flat patches and the round, tumour-like growths. The former were of various sizes, slightly elevated, dry, scaly, chapped-looking, and furrowed, and were followed by dirty, yellow pigmentation. The tumours varied in size from that of a split-pea to that of an egg, some being soft and others firm to the touch. They were either smooth and tense, or else had an excoriated surface, from which oozed serous and bloody fluid, and they were distinctly furrowed or lobulated. The subjective symptoms were principally itching, with occasional pain and a burning sensation. One of the most remarkable features of the disease was the exceedingly rapid development, and sometimes equally rapid disappearance, of the lesions noted. When the tumours underwent involution, pigmentation was usually left, but no permanent scars. Hebra first met with a case of this affection in 1872. He described it as new, and simply called it *neoplasma*. He met with a second case in 1874, which had been described by Hans Hebra and Geber; and these Dr. Duhring believed were the only two cases on record. During the course of the reading of the paper Dr. Duhring presented microscopical specimens from his case, as well as photographs and paintings representing its gross appearances; and at its conclusion exhibited the patient herself, whom he had induced to come on from Philadelphia.

The patient pointed out several large tumours upon different portions of the body, which had appeared in the few weeks' interval of Dr. Duhring's absence from Philadelphia. Some of these were quite as large as pigeon's eggs, and were already undergoing involution, the process beginning in the centre. A remarkable feature was the perfectly normal condition of the skin at the points where tumours had been, but had disappeared. There was not the slightest evidence of interstitial absorption.

*Nature of Iodide of Potassium Eruption.*

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Nov. 16, 1878), Dr. GEORGE THIN read a paper on this subject in which he gave the results of a microscopic examination of a portion of skin which was the seat of a bullous eruption, occurring in a patient who had been taking iodide of iron and iodide of potassium for three months' constitutional syphilis. The patient, a man aged thirty-five, the subject of renal and mitral regurgitant disease, was, when he died, under the care of Mr. Howard Marsh, at St. Bartholomew's Hospital. He ceased to take the iodide on May 10th, the eruption came out on the 13th, he was admitted into the hospital on the 18th, and died on the 22d. The eruption occurred in the form of bullæ and pustules on the face and on the dorsum of the right hand. Its nature was recognized by Mr. Marsh, Mr. Baker, Mr. Langton, and Dr. Crocker. The part examined was from the dorsum of the hand. The cutis under the bullæ presented three distinct areas of morbid change. The innermost area was composed of a structureless, almost homogeneous, but faintly granular substance, containing at several points rows of leucocytes; the middle area was composed of a layer of exudation cells suspended in a very delicate reticulum; the outer area was formed by remnants of connective tissue bundles separated from each other by wide spaces. There were a few bloodvessels in the second area, and a large number in the third. The vessels were distended by red corpuscles, and their walls were in many instances partially disorganized. The substance in the inner area consisted of coagulated albuminous material from the blood. The third area was bounded almost abruptly by the ordinary bundles of connective tissue of the cutis. The sebaceous glands were unaffected. Portions of bloodvessels in the deeper strata of the cutis, and distant from the bulla and from the sebaceous glands, were found distended and plugged with disorganized blood. The epidermis over the inner area was ruptured and disorganized. The bulla was formed by injury to the walls of the bloodvessels of a limited area, and by consequent escape of blood fluid, which displaced the connective tissue, pierced the rete mucosum, and accumulated under the horny layer of the epidermis. The author points out that the tendency of iodine, when present in the blood-current, to attack special points of the vessels, as has been shown in this case, explains all the varieties of eruption produced by iodine. The injury in its mildest form is shown in the common iodine-acne, in a more severe form in bullous and pustular eruptions, and in iodine-purpura. As an explanation of the latter form it is suggested that a portion of the wall of the vessel is so suddenly and completely destroyed that the local changes are limited to effusion of a small quantity of pure blood, and to plugging of the vessel. Amongst various conditions which it might be imagined act as causes of the more severe forms of iodine eruption, it is suggested that a sluggish circulation and deficient excretion may find a place, and some such hypothesis might be framed to explain why in the present case the eruption only appeared during the week preceding the patient's death.

Dr. BAXTER remarked upon the singular fact that the eruption did not appear until some time had elapsed after the drug was discontinued, and thought it would be interesting to know whether any of the iodide (usually so rapidly eliminated) occurred in the urine at the time of the eruption.

Dr. BARLOW said the question raised by Dr. Baxter was of importance; for in several cases he had seen of iodide and bromide eruption the rash had not appeared until after the drug had been discontinued. In one case which Dr. Lees had reported, bromine was found in the urine some weeks after its administration had been withheld. In several cases disease of the kidney had been found, which pointed to retarded elimination being possibly the cause of the eruption; thus

disproving Mr. Hutchinson's statement that on withholding the drug its effects disappear. He inquired whether there were any other *post-mortem* evidences of iodide of potassium poisoning, such as œdema of the glottis, or, as had been described by some French writers, a condition of "dissolutio sanguinis." Dr. Thin's paper was, he believed, the first contribution to the microscopical anatomy of those eruptions, and the view maintained seemed very reasonable, and preferable to the current but superficial doctrine of rash being due to an affection of sebaceous glands.

Dr. THIN, in reply, said he would endeavour to ascertain the facts asked for as to the condition of the urine and the occurrence of other morbid changes attributable to iodide. The important point practically was that if in renal disease iodine is but slowly eliminated, great caution should be observed in the administration of this powerful drug in depressed conditions of the system. The fact that the eruption favoured exposed parts, such as the face and arms, where the circulation was retarded, bore out the view that the iodine acted on the vascular walls, as in these parts it would have a greater opportunity of so acting. The specimen exhibited showed well the limitation of the changes to a small part of a vessel, which was dilated at that spot and blocked with coagulum.

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## SURGERY.

### *Experiments on Transfusion.*

At the meeting of the Société de Biologie, Dr. BROWN-SÉQUARD gave an interesting account of his experiments on transfusion. He had made use of different sorts of liquid for transfusion, such as normal blood, blood without its fibrine, and milk. In each case he found the results to be the same, but in the case of the milk the quantity that it was necessary to inject was more considerable than in the others. Ninety-five grammes of blood were drawn from a dog, and were replaced by the same amount of milk. Shortly after the operation (about forty-five minutes) there was no trace of milk-globules to be found in the blood, and the dog has continued in excellent health ever since the operation, which took place more than five months ago. M. Malassez found, upon examining the blood after the transfusion, a greater number of white globules than normal. In concluding his remarks, Dr. Brown-Séquard expressed the opinion that it was preferable to choose the arteries rather than the veins, and recommended the operation to be done very slowly, in order to allow the liquid injection to acquire the temperature of the blood. Transfusion also succeeds in animals when the blood made use of comes from a species of animal different from that of the one under experiment. It appears that Dr. Thomas, of New York, has tried the transfusion of milk on the living subject, and is convinced that it acts as well as blood.—*Lancet*, Nov. 2, 1878.

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### *Treatment of Nævus by Sodium Ethylate.*

Dr. J. BRUNTON, at a late meeting of the Medical Society of London (*Lancet*, Nov. 2, 1878), read a paper on the Treatment of Nævus by the External Application of Sodium Ethylate, exhibiting cases in illustration. Case 1. F. S—, aged seven, had, about a week after birth, a small red spot slightly raised on the cheek, which, at about the age of four months, had developed into a nævus of the size of a half-crown piece, bluish-red, and raised. It was treated, but with

only partial success, by ligature and needles, and when the sodium ethylate was applied, the growth was the size of a crown piece. Case 2. Also a female child, where a nævus was seated over the anterior fontanelle, the size of a shilling. In the first case the original nævus yielded in about a couple of months to the treatment, the continued obliteration of the fresh growth lasting for about a year. Sodium ethylate, which was first obtained and used by Dr. Brunton in 1871, is prepared by adding the metal sodium piece by piece to some absolute alcohol in a wide-mouthed bottle; cautious addition of more sodium until effervescence ceases results in the deposition of a crystalline substance— $C_2H_5NaO$ —at the bottom of the flask. The credit of bringing this substance and other alcoholic and ethylic derivatives before notice was due to Dr. Richardson, who, in a communication on the subject to Dr. Brunton, writes: "When it is brought into contact with water it is decomposed, the sodium becoming oxidized by the oxygen of the water to form sodium hydrate, and the hydrogen of the water going to reconstitute the common or ethylic alcohol. The change of ethylic alcohol into sodium alcohol transforms it from an irritant to a caustic. Laid on dry parts of the body the sodium ethylate is comparatively inert, creating no more change than the redness and tingling caused by common alcohol; but as soon as the part to which the substance is applied gives up a little water, the transformation described above occurs, caustic soda is produced in contact with the skin in proportion as water is eliminated, and there proceeds a gradual destruction of tissues, which may be moderated so as hardly to be perceptible, or may be so intensified as to act almost like a cutting instrument." Speaking of the practical uses of sodium and potassium alcohols, the same writer says that he does not yet see the means of applying them internally, but predicts for them a very extended application for external purposes, they being most potent caustics—*e. g.*, for the destruction and removal of malignant growths beyond the reach of the knife, by application to the surface, or by subcutaneous injection into the growths. Applied direct to the unbroken skin, their destructive action is less painful than would be expected, and when pain is felt it may be checked quickly by dropping upon the part a little chloroform, which decomposes the alcohol, converting it into a chloride salt and ether. Dr. Richardson had also found these alcohols to dissolve some of the vegetable alkaloids—*e. g.*, opium; and thus a way may be opened to one of the greatest needs in medicine—a sure, rapid, and painless caustic. "The caustic alcohols may be used in combination with local anaesthesia from cold. A part rendered quite dead to pain, by freezing with ether spray, could be directly destroyed by the subcutaneous injection of caustic alcohol, a practice very important in the treatment of poisoned wounds, such as the wound from the bite of a snake, or a rabid dog. It is by no means improbable that some cystic tumours may be cured by the simple subcutaneous injection of a little of these fluids, after destruction of sensibility by cold. Potassium and sodium alcohol, added to the volatile hydride of amyl, dissolve in the hydride, and produce a caustic solution. When this solution is applied to the skin the evaporation of the hydride takes place, and a layer of the caustic substance is left behind. This application was of value to the surgeon." The author, continuing, said that, compared with the action of nitric acid, there was but little destruction of the epidermis, and he considered that the sodium ethylate acted as an astringent, and the pain was not so severe as that caused by the nitric acid. In his cases hardly any scarring ensued.

Dr RICHARDSON expressed his deep satisfaction that one of the remedies he had introduced into practice in 1870 as the outcome of physiological research had proved so useful, and thanked Dr. Brunton for his recognition of the same. He referred to two cases of nævus, one of large size on the scalp, that he had successfully treated in 1870 by the application of sodium ethylate, and then pro-



ceeded to refer to the use of the ethylates in cases of scirrhus, and explained the strength of the solution that should be used, its mode of application, and the *rationale* of its action. The ethylates have not yet been administered internally, but they may prove of value, and, moreover, may clear up some difficult points in therapeutics; for example, the action of potassium iodide, a salt which is readily decomposed; and he rather inclined to the belief that the chief agent in the absorbent action of the salt was the liberated potassium, and not the iodine.

Mr. ADAMS said the objection to the knife is the subsequent cicatrization, for small scars may grow and become unsightly. He preferred a subcutaneous operation, and caustics had frequently failed in his hands. He asked Dr. Richardson how the ethylate acted. Was it by absorbing water, or by acting as an astringent?

Dr. RICHARDSON replied that a chemical change takes place; the ethylate takes up water from the tissues, re-forming alcohol; the alcohol then coagulates all the albuminous compounds in its neighbourhood, and the soda liberated acts as a caustic, its action being limited by the coagulation caused by the alcohol. The red blood-corpuscles are also acted on, becoming disintegrated and rendered crystalline, while the white are for a time left unaffected. The risk of too great hemorrhage from the rapid action of the ethylate in cases of pendent vascular tumours, might be met by diluting the ethylate with alcohol, so as to promote coagulation.

Dr. BRUNTON stated that the ethylate has little or no action on the healthy skin, that it limits itself to the spot to which it is applied, and that it can be prepared most simply by adding sodium in small pieces to absolute alcohol.

#### — *Encephalocoele.*

A very rare case has been described by MUHR, in the *Archiv für Psychiatrie*, in which the hernia cerebri presented beneath the nasal bones. During life it formed two tumours the size of walnuts, which lay on each side of the root of the nose, and extended against the nasal bones, at the inner and lower angles of the orbits. They were covered with wrinkled skin, and lessened on pressure, without any sign of cerebral disturbance. Pressure occasioned also a fine crepitation. The patient, who was forty-two years of age, had been epileptic from childhood, and for ten years had presented gradually increasing dementia. He died of phthisis. The frontal portion of each hemisphere was continued into a projection, inclosed in the dura mater, covered with the nasal bone, and separated from one another by the adhesion of the falx to the crista galli. These processes were covered with gray cortical substance, and resembled the olfactory lobes of certain animals. They contained, however, no prolongation of the lateral ventricle, and beneath them lay the optic tracts, apparently normal. On the basal surface of the left projection was a circumscribed area in which the pia mater was opaque and adherent. In the medullary layer of the peduncle of the process were irregular masses of gray substance, and also in the medullary layer of the frontal lobe, in front of the head of the nucleus caudatus. These contained peculiar cells, like those of the cerebral cortex. Otherwise the projection had the same structure as the adjacent part of the frontal lobe, and presented no resemblance to the olfactory lobe of animals. A peculiar degeneration of the large pyramidal nerve-cells was found in the precentral convolution, and in the frontal convolution of two other cases of mental disease the different stages of the changes in the cells were followed. First a pale ring appeared around the nucleus, due to the retraction of the protoplasm. This ring increased in size, while the protoplasm contracted into the processes of the cell, and finally the contour of the cell became less dis-

tingent, and only the nucleus remained. A portion of the cortex which had undergone this degeneration resembled closely the medullary substance; besides the undivided vessels only neuroglia and nuclei, in large pericellular spaces, could be seen. A careful description is also given of the bony skull in the case of encephalocele. The transverse diameter of the left orbit was considerably narrowed by the abnormal canal of the encephalocele, and the two nasal bones were completely fused. The bony canal of the encephalocele corresponded to the abnormally developed foramen cæcum. Ordinarily this foramen is occupied by a process of dura mater, which, according to Muhr, contains a large number of sympathetic nerves, and even sympathetic ganglia. It appeared, from careful measurements of the skull, that the deformity had not influenced the form of the rest of the cranium.—*Lancet*, Oct. 12, 1878.

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*Mimic Spasm of the Face cured by Stretching the Facial Nerve.*

Dr. BAUM, of Danzig, describes a case of the above (*Berl. Klin. Wochenschrift*, No. 40, 1878). The patient, a lady, aged thirty-five, had nursed her husband in a long and fatal illness, towards the end of which she had three or four epileptiform seizures. Immediately after the last, twitchings of the left half of the face, spreading from the eyelids downwards, were noticed. They recurred every two or three minutes with such severity that, without causing pain, they affected the patient's rest, as well as her general health. No abnormality was found in any of the organs of the body, and all that could be made out was that, except the muscles of the ear, all the facial muscles supplied by the portio dura of the seventh nerve were involved. All treatment by drugs—iron and other tonics, narcotics, and iodide and bromide of potassium—failed, as well as that by electricity and “derivatives;” and, as a last resource, stretching the nerve-trunk itself was proposed. The operation was performed on July 20, 1878, nearly six years after the first symptoms of *tic convulsif* showed themselves. The nerve was reached by cutting down the upper border of the parotid gland with antiseptic precautions, and drawing the latter with hooks downwards, outwards, and forwards. The nerve was found of a dark-red colour, but not sensibly thickened. Dr. Baum seized it with a torsion forceps, and squeezed it with some force, at the same time drawing it from its bed. A few small arteries had to be tied before closing the wound. A temporary paralysis of the left half of the face, of half an hour's duration, followed the operation, but the twitchings did not return, nor had they returned at the time of the publication of the paper in October. Dr. Baum thinks the origin of the nerve-lesion may possibly be explained by some injury received during one of the epileptiform attacks above mentioned. That there was a local inflammation of the trunk of the facial nerve after leaving the stylo-mastoid foramen, is certain. He thinks that the rather rough treatment to which the exposed nerve was subjected was largely concerned in the successful result obtained; and that probably, from the comparatively small number of cases which have been published since Billroth and Nussbaum spoke in favour of nerve-stretching, there have been many failures from *too delicate* handling of the particular nerves experimented on.—*Med. Times and Gazette*, Nov. 30, 1878.

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*Watery Discharge from One Nostril.*

At a late meeting of the Clinical Society of London (*Lancet*, Nov. 30, 1878), Sir JAMES PAGET read notes of a case of this. The fluid about two ounces, shown to the Society, had dropped from the left nostril of a lady, aged forty-nine, and Sir James stated that similar fluid has been dropping with rare intermissions for eighteen months. The fluid looked like pure water, or like that from the pia

mater, or that from an acephalocyst. There was no evidence of general ill-health, or any appearance of any kind of local disease of the nose. The history was nearly insignificant. In November, 1876, the patient had received a heavy blow over the left frontal sinus, but it seemed to have done no harm at the time. In January, 1877, she had one day of intense headache, but there had been no return of this. In February, 1877, she had a severe mental shock, and in May, 1877, the dropping began. From that time to the present the dropping continued, except for a fortnight in May, 1878, when she had bronchitis and took morphia, and on one occasion when it ceased for a night. A small drop fell or ran down the lip every few seconds, and about four ounces had been collected in an afternoon and evening. The quantity was generally uniform, but was increased by much exertion or by straining. On long standing the fluid deposited a minute quantity of a grayish substance, in which nothing could be found but the chance materials washed off from the surface of the nasal mucous membrane. Dr. Russell, Professor of Chemistry at St. Bartholomew's Hospital, reported the fluid to be slightly alkaline, and to contain proteid matter, probably albumen, chloride of sodium, phosphates, and a slight trace of iron, but no grape sugar. The specific gravity was 1004. Mr. Thomas Taylor had found the specific gravity on another occasion to be 1009 in one specimen and 1010 in a second, when he analyzed the fluid for Mr. Lawson, who had previously seen the case. [Mr. Taylor's analysis yielded similar results to that of Dr. Russell.] After suggesting several theories to explain the case, Sir James Paget concluded by expressing his opinion, though speaking with much doubt, that the fluid was derived either from a frontal or ethmoidal sinus, or from the subarachnoid space or the sac of the arachnoid membrane. He brought the case forward in the hope of hearing that similar cases had been observed, and that by collecting and comparing them we might gain some knowledge of their nature.

Mr. BRUDENELL CARTER had met with a case of constant limpid narial discharge in an old gentleman eighty-four years of age, who was the subject of gout. The discharge lasted for several years, and was only temporarily relieved by remedies, such as tannin snuff, etc. In reply to Sir James Paget, Mr. Carter added that the discharge came from both nostrils.

Mr. SPENCER WATSON had met with two cases of chronic nasal catarrh, in which the fluid was perfectly limpid. In one of these it lasted for a year or more, was mostly from one nostril, and was occasionally purulent. It seemed to come from the anterior part, was of a clear limpid character, and flowed more readily when the head was lowered. In another case, that of a man aged eighty-four, the discharge was always from one nostril, and was also more abundant when the head was bent. No remedies checked the secretion, which he thought to be due to chronic catarrh of the antrum.

Mr. LAWSON had had the present case under his care, and was struck with the similarity of the fluid to that flowing from the arachnoid of a boy after trephining. In the present case it was noticeable that very little escaped during sleep, which might be due either to less fluid being then secreted, or else that it dribbled down the pharynx and was swallowed.

Dr. HEWAN had observed a somewhat similar discharge (but he believed of catarrhal nature) from the left nostril of a phthisical young man. It was arrested by hypophosphite of soda, but in six or eight months it recurred, when it was again treated with good results.

Dr. ALTHAUS inquired whether the olfactory nerve was deranged. It was possible the discharge depended on some aberration of nerve-influence.

Sir JAMES PAGET, in reply, said that the sense of smell was unimpaired. The cases mentioned were of different nature to this, which did not depend on chronic

coryza or congested mucous membrane. The peculiarity lay in the fact that the discharge had dripped during the whole time from one nostril, in a simple continual stream, and never with any admixture of blood or pus. He must still leave the question of its nature open, whether it were cerebro-spinal fluid, or secretion from the ethmoidal or frontal sinuses. Any similar cases that may be recorded hereafter should contain an accurate statement of the amount and nature of the fluid.

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*New and Simple Method of Operating for Laryngeal Polypus.*

This method (described by VOLTOLINI in the *Monatschrift für Ohrenheilkunde*, Nov. 3, 1878) consists in passing an ordinary sponge, attached to a somewhat flexible wire, into the larynx and drawing it to and fro. The sponge may be used dry, or previously moistened with water. The moment the sponge enters the larynx, the latter closes spasmodically. The sponge is then held there till the larynx dilates for an inspiration, at which moment the sponge is to be pushed on through the glottis and drawn upwards and downwards. When the polypus is situate above the vocal cords there is no necessity to wait, but the sponge is twisted round as soon as it has entered the larynx. In cases in which the epiglottis can be seen by drawing the tongue forwards and depressing it with a spatula, the laryngeal mirror may be dispensed with in introducing the sponge, for on applying the sponge to the posterior surface of the epiglottis it easily slips into the larynx. This method, at first recommended only for soft polypi, is, according to the author, also of service in the harder forms. In these cases the wiping out of the larynx is repeated after several days (from four to eight) till the polypus becomes livid, mortifies, and falls off.

In a later number of the same journal (Nov. 8, 1878) Professor Voltolini gives an account of a case operated on by this method by Dr. Ariza, of Madrid, and described by him in *El Anfiteatro anatomico espanol y el Pabellon medico*, May 31, 1878. This case was one of a woman, aged 28, with a dark-red polypus of the size of a pea, attached to the free border of the left vocal cord near its anterior part, and hanging down into the trachea. After having in vain tried to remove it with various instruments, and also having employed local anæsthesia without sufficiently overcoming the irritability of the larynx, Dr. Ariza had recourse to Voltolini's method. The sponge was applied for several successive days and produced some bleeding from the polypus. As the growth, however, did not diminish much in size, Dr. Ariza endeavoured again to seize the polypus with a snare, and succeeded in tearing off a portion of it. After three or four more sittings, in which the sponge was used, the growth diminished rapidly in size, finally became violet or black-coloured, and on the following day had disappeared entirely. Dr. Ariza considers that this operation is not in the least degree dangerous to the patient, and it can be performed by any surgeon who is not a specialist, and that it is the only operation which can be employed in those frequently occurring cases in which there is absolute intolerance of the larynx. Professor Voltolini thinks that in the above case the operation might have been completed without the use of the snare, and cautions against endeavouring to tear off hard polypi by the sponge method. As above mentioned, it suffices in these cases to bruise and lacerate the polypus in order that it may mortify and fall off.—*London Med. Record*, Nov. 15, 1878.

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*Thyrotomy for the Removal of a Membrane Completely Obliterating the Larynx.*

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Nov. 30, 1878) Dr. FELIX SÉMON read a paper on a case of this. The patient had

attempted to cut his throat, and as the wound healed, it was found necessary to perform tracheotomy. The voice gradually became diminished, and laryngoscopically a tough dense membrane was found occluding the larynx between the false vocal cords, with evidence of ankylosis of the left arytenoid cartilage. The operation was undertaken to remove this membrane, and was the third case on record in which thyrotomy had been practised for such a purpose. A modification of Trendelenberg's tampon was employed to plug the trachea. The author urged great caution in the administration of chloroform through the tampon-cannula, the liability to asphyxia being greater than when inhaled in the ordinary way. In the operation itself he had intended to only partially divide the thyroid cartilage, leaving its upper part uninjured, so as to insure subsequent apposition of the parts, but he was compelled to fully divide it. He then found that there was a second membrane in the larynx, at the level of the original suicidal wound, that visible with the laryngoscope being probably due to the adhesion of the false vocal cords. He urged, therefore, in similar cases, an examination through the tracheotomy wound, to ascertain the presence of other membranes. The lower and primary membrane was being excised with a pair of curved scissors, when the patient began to cough violently. It was thought that the tampon-cannula did not sufficiently occlude the larynx, and that perhaps blood entered the bronchi. In reinflating the tampon the cough was replaced by an intense asthmatic paroxysm marked by extreme inspiratory dyspnœa. No obstruction was found in the tube, but on partial evacuation of the tampon-bag, the dyspnœa ceased, showing the author held, that an excess even of equal pressure on the inner walls of the trachea sufficed to produce reflex spasm. The sudden cough was in corroboration of Stoerck's statement that the posterior wall of the larynx, and especially the interarytenoid fold, excite cough when touched, whilst the anterior and lateral walls of the larynx are not so irritable. The wound healed by primary union, but in spite of daily repeated and long-continued passage of bougies through the mouth, there was gradual cicatricial stenosis of the larynx, and a month after the operation no air passed through the mouth.

Dr. Sémon felt sure there was no narrowing of the trachea, for he was able to explore it thoroughly with a goose-quill, and although the dyspnœa was both expiratory and inspiratory, it was chiefly the latter; but he believed it produced by reflex action from pressure on the nerves supplying the mucous membrane, and thought this borne out by some experiments which had been made.

Mr. HOLMES had had but small experience in thyrotomy, but he had seen no need to employ sutures, and criticized the procedure suggested by Dr. Sémon, of not completing the division of the cartilage, as diminishing the area for manipulation, and preventing the complete exposure of the ventricular bands. Dr. Sémon explained that one object he had in view was to preserve the anterior commissure of the vocal cords, and thus prevent that total loss of voice which Bruns had shown to follow after complete thyrotomy.

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*Pistol Shot through Right Ventricle, Septum, and Aorta; Ball lying in Left Ventricle; Sudden Death on fifty-fifth day.*

Dr. V. P. GIBNEY, at a late meeting of the New York Pathological Society (*Med. Record*, Dec. 14, 1878) presented this very interesting specimen, on behalf of Dr. F. M. Holly, of Greenwich, Conn. The following notes accompanied the specimen:—

"A. J., æt. 18 years, farm-hand, was on the 7th day of July, 1878, accidentally shot by a companion with a small Smith & Wesson revolver, calibre  $\frac{2}{10}$  inch. When seen by his attending physician, Dr. Mead, about an hour after the acci-

dent, he was in a state of partial collapse, the result of shock. He had no remembrance of the shooting, or of having fallen into the brook near which he was sitting at the time. He rallied rapidly without cough or expectoration, or any unfavourable symptoms other than slight dyspnoea, accompanied with pleuritic stitch on both sides for a few days. In less than a fortnight was again at work apparently well.

"He continued in good health, performing the ordinary labour of a farm hand without inconvenience, until the morning of August 30th, when, after a full breakfast, he went into the field, and was found about twenty minutes afterward dead behind the plough. *Autopsy* twenty-four hours after death; usual post-mortem signs present. A small cicatrix near left nipple one and three-quarters of an inch above, and toward median line. On opening thorax, the left pleura and the pericardium were found distended with serum and coagula. A small cicatrix could be seen on the anterior border of the upper lobe of left lung in a line with the external cicatrix, and under this was found an opening of one-quarter inch diameter in the pericardium. The lung was adherent, by firm bands of organized lymph in the immediate neighbourhood of the cicatrix, to the costal pleura and pericardium. Opposed to the opening in the latter; in the upper anterior margin of right ventricle, was found a small aneurismal sac of the capacity of not more than one drachm, the walls of which were very attenuated. This was ruptured, and a probe passed through the opening entered the ventricular cavity. The effusion into the chest was accounted for by this opening in the pericardium. A careful search failed to discover the ball."

In presenting the specimen Dr. Gibney made the following remarks: When I received the specimen, I opened the left ventricle, and found a small ball lying behind one of the pillars of the columnæ carneæ a little above, and to the left of the apex of the cavity. A delicate membrane covered the ball, and I left it just as it now can be seen in the specimen. On a more careful examination, an opening was traced through the upper portion of the septum, through the semilunar valve, lying against the septum, through the aorta itself to the left auricle. All these openings were found on a line with the opening into the right ventricle. The conclusion, then, seems to be irresistible, that the ball must have encountered a well-filled left auricle, been spent, and easily arrested, and have dropped down through the auriculo-ventricular opening, and have been lodged about its present site.

The sac on outer side of heart seems to be the parietal layer of the pericardium, and must have been formed by the blood forced out at the impulses of the heart. If this can then be properly called an aneurism, it is a dissecting aneurism. The wound through the right ventricle must have been valvular, and the pericardium here quickly healing prevented the escape of blood. This finally rupturing from over-distension, in all probability caused death.

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#### *New Operation for Phimosis.*

Being struck by the inconvenience of the ordinary bleeding operation, M. JUDÉ HUE (*Le Progrès Médical*) has proposed a section of the prepuce in the median line and on the dorsal surface, by means of the elastic ligature. For this purpose a needle, threaded with an elastic band, is passed between the prepuce and the gland until the bottom of the *cul-de-sac* is reached. The prepuce is then transfixed, and two ends of the elastic are knotted at the free border of the prepuce. In ten days or a fortnight the ligature comes away and the operation is complete. M. Horteloup had invited M. Hue to operate upon patients in his hospital, and the results at first were not encouraging, as a good deal of pain resulted for 24 or

48 hours. When the patients were seen three months afterwards, the results were found to be very satisfactory, so that M. Horteloup recommends this simple method in cases of phimosis without hypertrophy of the prepuce, and where there is no inflammation or thickening of the integument, and he thinks this plan will be found of great service in children.—*London Med. Record*, Nov. 15, 1878.

#### *Mechanism of Orchitis.*

In a recent paper on the mechanism of recurrent orchitis, and inflammatory orchitis generally, M. DESPRES arrives at the following conclusions: 1. Recurring orchitis and inflammatory orchitis are both due to the retention of semen in the testicle. 2. The cause of this retention is not always situated at the same point, but it is more than probable that swelling of the mucous membrane of the ejaculatory ducts and vas deferens, or of the lining membrane of these canals at the periphery in the prostate, or of the mucous membrane of the urethra, is the ordinary cause of retention of the semen. 3. The rarity of suppuration in cases of orchitis allows these inflammations to be designated seminal engorgement of the testicle, in the same way that the retention of milk in the mammae has been called lacteal engorgement. 4. The appearance of orchitis on from the tenth to the twentieth day of gonorrhœa, is in accordance with the functional activity of the testis; those patients with an actively exercised organ should develop orchitis towards the end of the urethritis. 5. The orchitis occurring during convalescence from gonorrhœa is not produced by the same mechanism as those following an injury. 6. Orchitis due to a wound, or to some urethral irritation, can be explained by swelling of the affected parts, particularly on a level with the ejaculatory ducts and vesiculæ seminales, which rapidly prevents the flow of semen into its reservoir, the vesiculæ seminales.—*London Med. Record*, Nov. 15, 1878.

#### *Sarcoma of the Male Breast.*

Dr. D'AMBROSIO relates the following case in the *Annali Clinici dell' Ospedale degli Incurabili*, 1878 (*La Medicina Contemporanea*, August, 1878). In 1873, a man aged 30 came under his care. In the centre of his left breast, in the situation of the nipple, was a fungoid tumour, apparently divided into two lobes by a narrow fossa; it was entirely destitute of skin, which formed a somewhat raised and hard ring at its base. The base of the tumour was rather wide, but it appeared to be quite movable on the subjacent tissues, and free from all attachment to the ribs. It was 7 centimetres (2.8 inches) in height; its greatest circumference was 12 centimetres (4.8 inches), and that of the base 6 centimetres. Its surface was studded with large granules; and to the touch it had a firm elastic consistence. The patient was constantly troubled with lancinating pains; the glands had not undergone the least change; his general appearance was healthy. The growth had commenced eight months previously without known cause; there was no hereditary predisposition. The tumour was removed, and the patient was soon afterwards discharged cured. It was diagnosed to be a spindle-celled sarcoma; and this was confirmed by microscopic examination.—*London Med. Record*, Nov. 15, 1878.

#### *Sarcoma of the Palm of the Hand.*

At a recent meeting of the *Société de Chirurgie* (*La France Méd.*, 1878, p. 253), M. Tillaux read a communication from Dr. GROSS, of Nancy, giving an account of a peculiar growth which he had recently removed from the palm of the hand. The tumour was developed in the subcutaneous cellular-adipose tissue.

The patient, a girl aged seventeen, had a tumour at the root of the right index finger, occupying the place of the adipose cushion usually situated there; it extended thence to the thenar eminence and the palm of the hand, forming a lower subcutaneous lobe and an upper lobe somewhat flattened by the aponeurosis. The tumour was painless, movable, and did not adhere to the deeper tissues. M. Gross hesitated in his diagnosis between lipoma and sarcoma. Microscopic examination of a piece of the tumour showed the presence of the latter. The tumour was removed by enucleation. Four or five days later an isolated process was observed in the wound, which gave rise to fears of a return of the disease. This was destroyed by caustic, and subsequently returned twice, finally disappearing entirely under the use of Canquoin's paste.

In the discussion which followed, M. Verneuil said he had long warned his pupil against the danger run in enucleating so-called "benign" tumour. Frequently the examination of a rounded encysted fibro-plastic tumour would show a sort of serous sac about the periphery, a very loose cellular tissue. Enucleation is easily effected, but on examination of the cyst which surrounds the tumour it is found to be composed entirely of fibro-plastic elements. In these cases local relapses of the most stubborn character are to be feared. M. Verneuil was accustomed in such cases, as in fibromata of the mamma, often mistaken for adenomata, to remove the whole cellular "atmosphere" about the tumour, going into the healthy tissue beyond the suspected zone. M. Desprès said he thought the growth in M. Gross's case was connected with the bone.—*London Med. Record*, Oct. 15, 1878.

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#### *Resection of the Wrist.*

In some remarks on a successful case of resection of the wrist (*Bulletins, et Mémoires de la Société de Chirurgie de Paris*, tome iv.), M. J. L. REVERDIN points out that the object of this operation is the conservation of an organ of tactile sensibility as well as of movement. In almost all instances resection of the wrist has been performed in the treatment either of white swelling of this joint, of penetrating wounds with or without fracture, or of arthritis occurring immediately or remotely as a result of such injury. In each of these instances, however, the operation is performed under unfavourable circumstances. The subject of white swelling is usually a scrofulous individual in a bad state of health, and debilitated by long-continued suppuration; there is always a risk of a return of the local disease, and the good results of a successful operation may be compromised or destroyed through the development of some visceral affection. It should be remembered, however, that even under the unfavourable conditions that attend white swelling, good results have been obtained from excision of the wrist by Lister and other surgeons. This operation has not given very brilliant results when applied in military surgery and in the treatment of injuries to the joint. In ten cases collected by Langenbeck in which the operation was performed after gunshot wound, two patients died and eight recovered. In two of the eight successful cases there was ankylosis, in one there was a very movable false-joint, and in each of the five remaining instances the hand remained quite useless. Of five cases reported by Dr. Otis, of total resection of the wrist performed during the American war, two only were successful; in three instances the hand could not be used, and in one it was necessary, in consequence of secondary hemorrhage, to amputate the hand. The case recorded by M. Reverdin was one of suppurative arthritis by propagation. There was no fracture, and no traumatic disturbance of the peri-articular soft parts. The patient, a male aged 41, was quite free from any scrofulous taint, and about the affected joint there had been some



inflammatory action capable, according to Ollier, of renewing in the periosteum regenerative properties that in adult life usually remain latent. The disorders in the peri-articular structures had been those merely of a simple inflammatory nature. This case, taken with two others, one reported by Lister, the other by West of Birmingham, seem, according to M. Reverdin, to indicate that in acute suppurative arthritis of the wrist the surgeon may fairly expect, notwithstanding the inflammatory complications, to preserve, through resection, a very serviceable hand. M. Reverdin in this case performed Lister's operation. In consequence of much swelling and induration of the parts around the wrist-joint, the proceedings were attended with difficulty, and the swollen structures were at some points torn and contused. It is pointed out that ablation of the bones of the carpus demands much patience on the part of the operator, and that it must always be a long and laborious if not difficult proceeding. The author is disposed to recommend, in order to facilitate the operation, freer exposure of the diseased bone through division of the extensor tendons. He holds that under present conditions of antiseptic surgery we may expect to attain union of tendinous and other soft parts by primary intention. The division of one or more of the extensor tendons during the operation of excision of the wrist is, it is argued, less likely to result in harm than the denudation of such structures along a considerable extent, or than the contusion and laceration caused by forcibly stretching them to one or the other side. Excision also is recommended of a small portion of each divided extensor tendon, when a portion of the skeleton of a limb has been removed. Unless extensive osseous regeneration take place, the tendons become too long and the muscles cannot act with proper efficiency. That sufficient regeneration of the bones can take place after resection of the wrist is impossible; and therefore, until the extensor muscles or their tendons undergo shortening, the fingers cannot be well extended. It would not be necessary, it is held, to divide any of the tendons in front of the wrist; for, in consequence of the shortening of the extensor tendons the fingers could be drawn backwards, and so placed in the most favourable condition for the efficient action of the relatively elongated flexor tendons.—*London Med. Record*, Oct. 15, 1878.

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*Wounds of the Chest with Prolapse of the Lung.*

A. VÖLKELE (*Berliner Klin. Wochenschrift*, No. 7, 1878) relates the following case: A young man, aged 20, was stabbed in the left axillary line in the eighth intercostal space. When Dr. Völkel saw him, some hours afterwards, the opening was closed by a hernia of the lung as large as a pigeon's egg. It was stated that at first air passed in and out of the wound, and that this was followed by much hemorrhage; this was confirmed by the presence of a rather considerable pneumothorax on the left side, and by dulness of the percussion-sound from the base of the left chest upward. Reduction being prevented by the tight nipping of the neck of the prolapsed portion, iced compresses were applied. At the end of three days the fever had disappeared. Fourteen days after the injury, the air and blood in the left chest were almost absorbed, and the patient felt well. For some days the hernia of the lung was somewhat increased, in consequence of the paroxysms of cough; it did not, however, slough, but soon became covered with abundant granulations, and gradually contracted, so that healing was complete at the end of five weeks. The author points out the analogy between the course of this case and that of unreduced omental hernia.—*British Medical Journal*, Nov. 9, 1878.

*Osteogenous Sarcoma in Children.*

In the *Jahrbuch für Kinderheilkunde*, Band xii., W. OST relates some cases of sarcoma of bone which he has observed in children. The subject of the first case was a girl aged 9, who had a round-celled and spindle-celled periosteal sarcoma involving the lower and middle thirds of the left femur. The second case was also one of periosteal tumour as large as a child's head, involving the upper tibial epiphysis of a boy aged 6½. In neither case could any cause be ascertained. In the third case, one of sarcoma of the nasal bones and upper jaw, the origin of the tumour was attributed to a blow with a hammer, which the patient, a child four years old, had received a month before the time when the tumour, then the size of a walnut, was first recognized. Extirpation of the tumour was followed by obstinate returns, and the child died of general infection. To these cases, Ost adds forty others of which he has found records. Of thirty-two cases of periosteal tumour, the bones of the skull were affected in eight cases, the jaws in ten, the clavicle in one, the humerus in two, the metacarpus in one, the spinal column in one, the pelvic bones in two, the femur in four, the tibia in two, the fibula in one.—*British Medical Journal*, Nov. 9, 1878.

## OPHTHALMOLOGY AND OTOTOLOGY.

*Ergotine in Acute Ophthalmia.*

Dr. PLANAT, of Nice, has found (*Journ. de Thérap.*, Oct. 25) ergotine act with efficacy and promptitude in proportion as oculo-palpebral phlegmasiæ are simply inflammatory. In blepharo-conjunctivitis the improvement is first observed in the conjunctiva; and in keratitis, although still very active, it is a degree less so than in the more superficial affections. It is also of great service in iritis, rapidly subduing the acute manifestations and preventing their extension to the external membranes of the eye. When these last are the seat of a chronic fluxion dependent on a scrofulous or dartrous diathesis, ergotine, without influencing the constitutional affection, acts none the less efficiently on the inflammatory element—a fact of importance, as by generally preserving the eye from plastic deposits, corneal ulcers, and consecutive staphylomas, it allows of the treatment for the diathesis being more promptly put into force. The formula which Dr. Planat recommends is from one to one and a half gramme of ergotine in twenty of glycerine or rose-water, of which from eight to ten drops are to be inserted in the eye every two hours. Where there is violent inflammation of the eyelids or distension of the conjunctiva, a rag wetted in this mixture should be left on the parts for some hours. In general, two or three days suffice for the subdual of the most intense blepharo-conjunctivitis. Dr. Planat has employed the ergotine in this way, with invariable success, for several years past.—*Med. Times and Gazette*, Nov. 2, 1878.

*The Pathology of Glaucoma.*

In a communication read at the meeting of the Italian Ophthalmological Association in September, 1877 (*Annali di Ottalmologia*, Anno vii, Fasc. I), Professor DEL MONTE described the appearances found in a glaucomatous right eye which he had removed from a lady aged 65. She had undergone iridectomy in

the left eye on account of commencing glaucoma, and the right eye was removed in consequence of the persistence of pain in it.

A microscopic examination made after the two halves of the eye had been preserved twenty days in alcohol, presented the following appearances. The ciliary processes were very small, their tissue having a fibrous aspect, with scattered cellular elements; and above their pigment the ciliary portion of the retina was observed to be adherent. The ciliary muscle was very slender; there was no trace of the canal of Schlemm, and the iris was adherent for a considerable extent to the inner surface of the cornea. On the anterior surface of the iris a small streak of newly-formed connective tissue was observed. The author called attention to a layer of connective tissue interposed between the epithelium and Bowman's membrane; the latter had disappeared from part of the periphery of the cornea, leaving only the connective tissue. The author believed that he was the first to observe this change; if it had not been described by others, it was probably because the attention of ophthalmologists had been principally directed towards the intra-ocular extremity of the optic nerve, the retina, and the ciliary processes.

Dr. Del Monte reviewed the opinions held as to the pathology of glaucoma, and expressed his belief that the increase of intra-ocular pressure is not due to accumulation of aqueous humour or of fluids which should escape from the eye; since clinical experience proves that the occlusion of the channels of diffusion proceeds *pari passu* with a diminution in the production of the fluids. The slow reformation of the anterior chamber after iridectomy, especially in chronic glaucoma, sufficiently proved this.

From an anatomo-pathological point of view, the author said, it is demonstrated that in glaucoma there is a slow process of sclerosis of the anterior uveal tract and of the cornea; and this can only be the result of stasis, as in analogous lesions of other parts of the body. The author believed that the stasis, which is the primary condition of glaucoma, is in the lymphatics rather than in the blood-vessels; since, in cases of vaso-motor paralysis in which there is retarded circulation, the intra-ocular pressure is diminished rather than increased.—*Lond. Med. Record*, Oct. 15, 1878.

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## MIDWIFERY AND GYNÆCOLOGY.

### *On Indefinitely Prolonged Uterine Pregnancy.*

In an inaugural thesis of much merit, Dr. MÜLLER, of Nancy, discusses the question whether the retention of the embryo in the uterus far beyond the period of pregnancy is possible; in other words, whether the cases of so-called "missed labour" have a claim to be believed. He has collected all the known cases in literature, and has subjected them to a critical examination; and the result at which he arrives is, that not a single case of so-called uterine retention of the fœtus is to be regarded as such, but is to be explained in some other way, and that most of these cases are instances of extra-uterine pregnancy. In previous centuries, many cases of retention of the embryo in the uterus have been described. Where sufficient descriptions have been given, the author has found it easy to explain the cases by extra-uterine pregnancy. When the fact that the embryo was capable of development outside the uterus became known to obstetricians, the number of cases of retention of the embryo in the uterus remarkably

diminished. In this respect, a hitherto unpublished case which occurred to Stoltz is of much interest.

A woman, aged 33, who had had one easy labour in November, 1830, felt herself again pregnant, and at the same time suffered from symptoms of peritonitis, which did not entirely disappear during the whole period of pregnancy. Towards the end of pregnancy she had fever. The pain became intolerable, especially when the child moved. At the end of September, 1831, pains like those of labour set in. A medical man endeavoured to apply the forceps, but failed; he then attempted to turn, and, not succeeding in this also, he withdrew. A second surgeon who was called acted on the expectant plan. In the mean time the pains ceased, the woman felt no further movements of the fœtus, and an abundant secretion of milk set in. At the end of December there was a discharge of blood, which recurred at the same time in February, March, and April, 1832. In May a new attempt at delivery was made, and as the contraction of the os uteri could not be overcome, large doses of ergot were given. After this the patient became rapidly worse, and died at the end of June. On *post-mortem* examination a large tumour was found, intimately adherent to the intestine, and containing the fœtus. No one doubted that this was the uterus, and the case was diagnosed as one of retention of the fœtus in the uterus. Some time later Stoltz made a more accurate examination of the tumour, and succeeded in detaching a uterus 7 centimetres long, with its appendages.

Müller does not deny that the so-called missed labour may occur in animals, but does not consider it justifiable to draw any conclusion therefrom with regard to the human female, whose uterus has quite a different form from the *uterus bicornis* of animals. In recent French literature, there is not a single trustworthy case of uterine retention. The case of Camerarius, cited by Schröder, is identical with the so-called stone-child (lithopædion) of Leinzell. Freund's case is regarded by the author as one of abdominal pregnancy; and an examination of the cases recorded by Mühlbeck, Liebmann, and other authors, English and foreign, leads to the same results. The author considers "missed labour" as the attempt at parturition at the end of extra-uterine pregnancy, which soon again passes off, and may be followed by retention of the fœtus for many years and its calcification.—*London Med. Record*, Nov. 15, 1878.

### *Ovarian Pregnancy.*

In the *Annales de Gynécologie* for July, 1878, Dr. ALBERT PUECH, after quoting six cases of ovarian pregnancy, draws from them the following conclusions. 1. Ovarian pregnancy takes place, but up to the present time it has been rarely observed. 2. Most of the cases described under the heading of ovarian pregnancy have been dermoid cysts, ovario-tubal pregnancies, or abdominal pregnancies in which the placenta has become attached to the ovary. 3. The anatomical conditions found in an ovarian pregnancy are: *a.* Absence of the corresponding ovary; *b.* Union of the fœtal sac to the womb by the ligament of the ovary; *c.* Presence of ovarian structures in the walls of the sac; *d.* Independence of the Fallopian tube as regards the formation of the fœtal sac. 4. There are two varieties, according as the fœtus is developed in the vesicle which has remained open, or in a vesicle which has closed immediately after fecundation. 5. The progress and termination of ovarian pregnancy do not materially differ from those of abdominal pregnancies. 6. Laparotomy is the only rational treatment when the pregnancy has arrived at term.—*Lond. Med. Record*, Oct. 15, 1878.

*A Case of Labour Complicated with Occluded Double Vagina:  
Face Presentation ; Craniotomy.*

Dr. JAMES ARTHUR RIGBY reports (*Lancet*, Nov. 16, 1878) the following interesting case.

Mrs. W——, aged thirty-one years, pregnant. On examination there was at first a total inability to find any evidence of a vaginal orifice, but eventually one was found along which the finger could be forced, and at the extremity of which the tip of the finger impinged upon a hard body ; the finger was tightly constricted in all its length by the walls of the canal, so as to render it quite impossible to make a more effectual vaginal examination. On external examination, the pudendæ were seen to be swollen, and only the faintest trace of a vaginal orifice could be made out. The forcible examination caused considerable hemorrhage.

The first question was whether the woman was pregnant or not. This was decided in the affirmative on the following grounds : Her regularity of menstruation before marriage. The fact that menstruation ceased almost immediately after marriage. Quickening occurred about the normal time. She had felt vigorous movements of the child up to the very time of my visit. The breasts exhibited the usual signs of pregnancy. The fœtus could be made out lying obliquely, with the head in the right iliac region, while its inferior parts were directed upwards towards the left lumbar region. A dense hard body, presumably the fœtal head, as has been stated, could be felt with the tip of the finger at the upper extremity of the vagina. Finally and conclusively, the fœtal heart-sounds could be heard distinctly a little below and to the right of the umbilicus.

The signs of pregnancy, then, were complete, notwithstanding the apparent improbability of impregnation having been able to be effected under such adverse circumstances. On reviewing the case, it was thought best to postpone all operative proceedings till the advent of labour, so as to have the advantage of the natural relaxation and dilatability of the parts during that time.

Two days after my first visit the woman commenced in labour. On our arrival, we found that the pains came on at tolerably regular intervals. Examination revealed that the vaginal canal was slightly more dilated than it had been at the first visit, though still rather difficult to find. No signs of the os uteri could be made out. Each examination caused the woman to bleed a little. After waiting a short time, it was deemed advisable to introduce the smallest of Barnes's water-bags ; this was effected with some difficulty, and at the end of an hour one of the larger bags was introduced. On taking this out we were very much astonished and gratified at the result. The vaginal canal was now dilated to almost its normal calibre ; at its upper extremity the os uteri could be felt, thin and somewhat rigid, but dilated to the extent of about two inches in diameter, while the distended membranes were projecting through it. The head was presenting. The vagina, however, could now be felt to be divided into two parts by a distinct septum running in an antero-posterior direction, the upper of which parts was in connection with the dilating os uteri, while the lower formed a cul-de-sac, in which nothing could definitely be made out. The os uteri dilated rapidly, and the membranes soon after ruptured, when it was discovered that it was a face presentation, mento-posterior. The long forceps were now applied, but, in consequence of the pubic arch being narrow, and the nature of the presentation, it was found utterly impossible to deliver with them, and craniotomy was reluctantly resorted to. The patient was delivered within four hours of the first application of the water-bags.

*Remarks.*—The great interest in this case lies first in the fact of impregnation occurring under such adverse circumstances, there being absolute proof that there had never been any penetration of the male organ ; indeed, there was the greatest

difficulty in introducing the finger, and that was accompanied by considerable bleeding. This, then, from a medico-legal point of view, distinctly proves that no degree of penetration is necessary for impregnation, and that the wandering spermatozoa must have found their way from the outside of the body, along an extremely narrow vagina, and so into the uterus.

The next point for consideration is the satisfactory manner in which the water-bags acted. They caused little or no expressions of pain, while they rapidly opened out the whole of the vaginal canal. Before their application all was chaos, afterwards order reigned supreme. We were prepared for a combined action of slight incisions with forcible dilatations, but these were rendered quite unnecessary on the application of the water pressure. It appears to me that in the above case the walls of the vagina were simply most rigidly contracted, and its cavity was further encroached upon by the membranous septum referred to. Doubtless the cavity of the uterus was also divided into two parts, one of which only was tenanted.

In conclusion, I may state that, notwithstanding the very untoward appearance of the case at first, very little doubt exists in my mind that, had it been an ordinary *vertex presentation*, delivery might have been effected by means of the long forceps, and so a living child born.

The patient made a good recovery.

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*The Treatment of Pregnancy complicated with Cancerous Disease of the Genital Canal.*

At a late meeting of the Obstetrical Society of London (*Med. Times and Gazette*, Oct. 19, 1878), Dr. HERMAN read a paper on this subject. He first narrated two cases which had come under his own care. In one, labour was obstructed by a cancerous tumour of the rectum. The patient was delivered by cephalotripsy, and died from peritonitis. In the other the cervix uteri was fixed by cancerous disease; abortion was induced at the end of the fifth month; the patient lived seven months afterwards, marked relief to the symptoms having followed the abortion. Then followed an analysis of 180 recorded cases, collected from different sources, and classified. From them he drew the following conclusions: 1. That whatever influence cancer of the uterus may have upon conception is adverse to its occurrence. This was inferred from the small number of cases in which the patient was suffering from cancer at the time conception took place, as compared with the frequency of the disease. 2. That cancer of the uterus tends to produce the intra-uterine death and premature expulsion of the fœtus. This conclusion followed from the large proportion of premature births, and of not only still-born, but decomposing children. 3. That the growth of cancer of the uterus is, as a rule, accelerated during pregnancy. This was supported by *a priori* arguments from general pathology, by the analogy of the breast, and by the improvement which often followed the termination of the pregnancy. 4. That with cancerous disease affecting the whole circumference of the os uteri, labour may be quick and easy, and the patient may recover well and live for months afterwards. 5. That when delivery under such conditions is accomplished by natural efforts, expansion of the cervix usually takes place by fissuring. 6. That this fissuring does not usually augment the risk to the mother. 7. That imitation of this natural process, by making incisions, neither increases the danger at the time nor accelerates the progress of the disease subsequently, and that it often greatly facilitates delivery. 8. That the cases in which the cancer forms a tumour of great size or hardness are the ones in which delivery by natural efforts will not take place. 9. That where the above characters are absent no definite criteria can be drawn from the local

conditions by which to foretell the behaviour of the os uteri during labour. 10. That where delivery of a living child *per vias naturales* is impossible, such limited experience as we have shows that there is but little difference, as to the risk to the mother, between craniotomy and Cæsarean section. 11. That a part of the cervix uteri may with safety be removed, either during pregnancy or during labour. These last eight conclusions were supported by the evidence of recorded cases. The author then considered from these data the practice to be followed. He assumed that the life of the mother was the first consideration, and that the production of abortion was justifiable if maternal life could be saved or prolonged thereby. The following were the rules of practice which he thought indicated—

1. That where it is possible to remove the disease, either during pregnancy or at the time of labour, it ought to be done.
2. That where this cannot be done the safety of the mother is best consulted by bringing the pregnancy to an end as soon as possible.
3. That when labour has actually come on, expansion of the os uteri should be aided by making numerous small incisions in its circumference.
4. That dilatation of the cervix uteri being in progress, if uterine action should be deficient, and it should become necessary to accelerate labour, the use of the forceps is, as a rule, better than turning.
5. That when dilatation of the cervix cannot take place, even after incisions have been made, either from rigidity or magnitude of the tumour, Cæsarean section should be performed.

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#### *Laparo-Elytrotomy.*

This operation has recently been performed in England on two cases, with fatal results of the mother, but successfully to the children. Dr. HIME, who operated on the first case (*Lancet*, Nov. 9), adds, in conclusion, “considering the easy nature of this operation, the certainty of saving the child, and the strong probability of saving the mother, it is a question how far craniotomy will ever again be justifiable, and whether Cæsarean section should not drop into oblivion.” In the other case operated upon by Dr. EDIS (*British Med. Journal*, Nov. 20, 1878), the bladder was opened. The case was an unsatisfactory subject for operation, and it is believed that the issue would have been the same if Cæsarean section or cephalotripsy had been performed.

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#### *Oxalate of Soda in Metritis.*

Dr. GATTI (*Rivista Clinica di Bologna*, Nov. 3, 1878) alleges that he has obtained excellent results from the employment of oxalate of soda in metritis and puerperal metro-peritonitis. He gives it in daily doses of 89 centigrammes (12½ grains) in 125 grammes of mucilage. Lange has already spoken favourably of this remedy, not only in metritis but also in puerperal infection. Gaspari, on the other hand, denies that it possesses any antiseptic property.—*London Med. Record*, Nov. 15, 1878.

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#### *Total Extirpation of the Uterus.*

Recently, Professor FREUND of Breslau has performed this operation in two cases of carcinoma, on patients whose ages were sixty-two and fifty years respectively, and his method is described at full length by himself in *Volkmann's Sammlung Klinischer Vorträge*, No. 133, and in the *Centralblatt für Gynäkologie*, 1878, No. 12; and the details of his second case, to which we shall here chiefly refer, are given by his assistant, Dr. Fränkel, in the *Berliner Klinische Wochenschrift*, No. 31, 1878. Both operations were successful, although long and tedious; the second lasted two hours and a half. The antiseptic method was strictly followed, except that the spray was not allowed to enter the abdominal cavity. Dr. Fränkel, however, states that if a half per cent. spray instead

of the usual two per cent. is used, it answers equally well, and does not irritate the peritoneum, besides being much pleasanter to the operator's hands. The following is an outline of the method adopted, but we do not pretend to enter into such details as must be known by any one who attempts the operation for the first time. Previous performance of all its steps on the dead body is essential. The patient is prepared by a course of warm baths, a special nutritive and highly digestible dietary, and a trustworthy aperient, which is given twelve hours before the operation. The uterus is disinfected at the time of the operation with 10 per cent. carbolic acid, and, the patient lying with her head lower than her pelvis, an incision is made in the linea alba, a ligature is passed through the peritoneum of the anterior part of the pelvis to prevent its collapse, and the intestines filling the pelvis and covering the uterus are raised, pulled upwards, and held wrapped in a soft linen cloth soaked in warm carbolic acid solution until the operation is finished. This usage has no ill effect on the bowel, and Dr. Fränkel remarks that at the end of the second operation it was not in any way altered in appearance. To control the movements of the fundus uteri a thread is passed through it and held by an assistant. The broad ligaments of either side are now ligatured in three portions. "The upper ligature transfixes the Fallopian tube and the ligamentum ovarii; the middle one passes through the ligamentum ovarii side by side with the upper ligature, and returns through the round ligament; and the lower pierces the round ligament, and is carried twice through the vaginal wall—first through the antero-lateral part of the vaginal roof into the vagina, and then back through the postero-lateral part of the vaginal *cul-de-sac* behind the base of the lateral ligament into Douglas's pouch." The uterus is then removed through the roof of the true pelvis, the incision commencing in front, "two centimetres above the limits of the bladder, as marked by the point of a male catheter in that viscus, and running with a bend from the lower ligatures up to the broad ligaments, and then to the back of the uterus, two to three centimetres above the deepest point of the pouch of Douglas." In the second operation the bleeding from a few small branches of the right uterine and vaginal arteries was difficult to check, and nearly three-quarters of an hour were consumed in doing it. For future operations Professor Freund has devised an improved *serre-fine* to control the vessels.

After drawing the ends of the ligatures into the vagina, the peritoneal opening is closed, and the abdominal incision, after replacement of the intestines, is brought together in the usual way; a firm antiseptic bandage is applied, and all the precautions usual after ovariectomy observed.

In the second case there was *absolutely no* after-reaction, and the highest temperature reached was 38.2° Cent. (100.7° Fahr.) on the second day, while the pulse never exceeded 84. The patient left her bed on the fourteenth day, and she is now, like the first patient whose uterus Professor Freund removed, fatter than previously, and able to work hard *in the fields*.

Thus far, thanks probably to Lister's method, the new attempts at removal of the whole uterus have perfectly succeeded. Whether the cancer will relapse or not, can, as Professor Freund says, only be decided "after a year and a day." The operation appears not to be nearly so complicated or severe as many cases of ovariectomy, and it is suited to all cases of cancer of the neck and body of the uterus, provided the "anterior part of the vaginal *cul-de-sac* (*das vordere Scheidengewölbe*) is completely healthy." Dr. Fränkel further believes that by its means we shall safely remove "malignant tumours of the fundus—sarcomata and cancers—and subserous and interstitial fibroids." He also believes that cases of irrepressible hemorrhage due to uterine fibroids which cannot be enucleated will be better cured by total extirpation of the womb than by Hegar's plan of castration.—*Med. Times and Gazette*, Oct. 19, 1878.



## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

*A Test for Chloral Hydrate.*

Dr. FRANCIS OGSTON, Jr., makes the following observations (*Edinburgh Med. Journal*, Oct. 1878) on the test for chloral by sulphide of ammonium.

The addition of stale sulphide of ammonium to a solution of chloral hydrate of moderate strength, say 10 gr. to the drachm (the strength of the British *syrupus chloralis hydratus*), causes, in a short time (*not immediately*), the colourless liquid to assume a slight orange-yellow colour, the liquid remaining clear; on letting it stand, the colour gradually deepens to a brown, and now a cloudiness comes over it, which in about half an hour, or perhaps longer, is deposited as an amorphous precipitate of a brown colour, and which appears to consist of sulphur.

While the change of colour is going on and the brownness appears in place of the orange, a gas is given off of a most offensive smell, apparently a mixture of chloroform and hydrogen sulphide, with something in addition, in such quantity as to fill a large room in a few minutes.

In order to find out the smallest quantity of chloral hydrate which would give a reaction with ammonium sulphide—

(a) I dissolved 1 gramme of it in 100 cc. of water, took 1 cc. of the solution and added 1 cc. of ammonium sulphide, when the solution became of a canary yellow colour, passing through orange-yellow to brown in the course of about six hours, letting fall a slight brown precipitate and giving off a characteristic smell.

(b) I then took 10 cc. of the above 1 p. c. solution, which I put into 100 cc. of water, and, on adding 1 cc. of ammonium sulphide to 1 cc. of this solution, I got in about half an hour a slight straw colour, which had deepened to a pale orange colour in twelve hours, giving off no smell.

(c) Lastly, I took 1 cc. of the solution *a*, which I added to 100 cc. of water. Of this solution I took 1 cc., and added 1 cc. of ammonium sulphide, and, after standing for eighteen hours, the liquid had changed to an exceedingly faint straw colour.

Thus 1 cc. of *a* solution (0.01 gramme of chloral hydrate) gave the brown colour, the precipitate, and the smell.

1 cc. of the *b* solution (0.001 gramme) gave an orange colour, but neither precipitate nor smell.

1 cc. of the *c* solution (0.0001 gramme) gave a very faint straw colour.

The first and second of these results are, I think, sufficient to establish the presence of chloral hydrate; the third I should hardly trust to, as the reaction was so faint, though I verified it by repetition of the experiment.

I may further state, that the similarity of the reaction of ammonium sulphide with chloral hydrate to that with antimony salts, suggests a caution in accepting the orange coloration alone as a certain test for either poison. Antimony, on the one hand, may be known by the orange precipitate thrown down by the addition of an acid, which does not follow when it is chloral hydrate which is present; and chloral hydrate, on the other, by the fact that the orange colour deepens on standing to a dull brown.

In conclusion, chloral hydrate alone seems to give this reaction with ammonium sulphide, for I have submitted many of the substances of similar chemical construction to the test without any such result following. Among these were chloroform, chloric ether, formic acid, etc.

## AMERICAN INTELLIGENCE.

## ORIGINAL COMMUNICATIONS.

*A Penetrating Wound of the Right Common Carotid Artery and Internal Jugular Vein, resulting in a "False Aneurism," with Rupture of the Tumour, and Complete Recovery of Patient.* By E. PAUL SALE, M.D., of Aberdeen, Miss.

Miss Josie H., of Madisonville, Tenn., a blonde, æt. about 19 years, during the month of August, 1877, whilst rapidly descending a flight of stairs, by a misstep fell, together with a China bowl which she was carrying; the bowl was shattered, and she falling on it, was wounded by a triangular fragment, which penetrated the mesian line of the neck just over the cricoid cartilage, from which it glanced to the right, and passed obliquely downwards, inwards, and outwards into the "inferior carotid triangle," making a valvular wound: it tore up in its passage subcutaneous cellular tissue, and wounded either the right common carotid artery or internal jugular vein, possibly both, but as there seems to be some difference of opinion between her then attending surgeons as to the exact nature of the wound, I have thought it well to quote *in extenso* from letters received from two of them, Dr. W. N. Bicknell, of Madisonville, and Dr. R. F. Scruggs, of Sweetwater, Tenn. Before making the quotations, however, it is well to mention that the young lady was rescued from immediate death by hemorrhage, through the presence of mind of a sister who happened to be near and pinched up a fold of skin which included the wounded vessel or vessels, and held it until a surgeon arrived.

Dr. Bicknell, in a letter of Dec. 3, 1877, says: "I saw her fifteen hours after receiving the injury. [Dr. M. C. Duncan, of Madisonville, had preceded him; it is to be regretted I have not his opinion of the case.] I found her much prostrated, extremities cool, pulse frequent and feeble, so much so that at times it could scarcely be counted; occasional vomiting; at one time during the night she sank exceedingly low, but revived by the use of stimulants, and from that time on, although very feeble, she progressed favourably, until an attack of dysentery supervened, which prostrated her again to an alarming degree, after which she slowly recovered to the stage she was when she left home. As to the injury, and how she was hurt, etc., I presume you are fully informed. The flow of blood was in a *continuous stream*, as represented to me by Dr. Duncan and others, was easily controlled by pressure; and after it was stopped, an adhesive plaster was applied over wound, and there was no more bleeding for several hours, until she exerted herself a good deal when the bowels acted. The flow of blood, though considerable at the second hemorrhage, I understand was of the same character and appearance as the first. A compress was then applied below the wound on the right side of the neck, which controlled the hemorrhage, and it did not again recur. I am of the opinion that the bleeding in this case was from the jugular vein being torn; the

blunt rough instrument inflicting the wound *may* have passed over the artery, bruising or otherwise injuring it, so that it may have given way, and now be a cause in the case with the wounded vein; but I do not think the carotid artery was tapped at that time: the bleeding *when arrested* was too easily controlled, the *steady* flow and appearance of blood, as represented at the time, was not arterial, as I believe. The compress that controlled the hemorrhage, it is true, was applied on the *cardiac* side of the external wound, but upon the *distal* side of the wounded vessel as I fully believed upon examination at the time I first saw her, and during the progress of the case the compress was back of and below the line of internal wound and over the site of the bloodvessel.

"The wound healed kindly and progressed well until she was debilitated by her dysenteric attack, which retarded it some, but did well at last. I did not notice *any tumour* or anything *abnormal about the wound* before she left."

Dr. Scruggs was with her during her second hemorrhage, which occurred about ten or twelve hours after the accident. In a letter to the brother of the young lady, he says: "I did not see your sister till after she had already had a very copious hemorrhage, and almost pulseless, reaction having only partially taken place, and as the hemorrhage was then checked, no interference was made nor troubling the wound in any way except to close the same and apply adhesive strips. When, after a time, a second hemorrhage took place, with a *florid* coloured blood, but no jetting that I discovered—the action of the heart had been so enfeebled in consequence of her former hemorrhage that the jetting may have been absent on that account. The artery being next to the windpipe, and the glancing having first been received on this, and borne off by the loose skin and soft parts, would most likely tap the nearest bloodvessels thereto, coupled with the fact that the blood was *florid*, and pressure between the puncture and the heart seemed to control it, I inferred that the right common carotid artery was tapped. The flow of blood being so rapid, and extreme prostration so instantaneous, I was led to the above conclusion. . . . There might be a possibility of the vessel being the jugular vein, but from my single visit and observation from all of the surrounding exciting circumstances I did not form this last conclusion. . . . The case was left in charge of Dr. Duncan, who was hourly expecting the counsel of Drs. Bicknell and Upton. The results of their deliberations have not been made known to me."

Miss H. came under my charge Nov. 6, 1877; she had then been in this city several weeks visiting her brother, and in giving a history of her case, told me that about the 15th of October past, after playing with a child, and tossing it up in her arms, she noticed the appearance of a pulsating tumour about the size of a filbert in the region of the "inferior carotid triangle" a little above and outwards from the *sterno-clavicular* articulation, which rapidly increased in size up to the time of her first consulting me. When I saw her first (Nov. 6, 1877) the tumour extended over the whole of the anterior and the inferior two-thirds of the right side of the neck, also encroaching somewhat on the left side; its inferior boundary was well defined by the *sterno-clavicular* notch, and the inner half of the clavicle making a globose tumour about as large as the half of a cocoa-nut of medium size, and very like it in shape, except that the acuminated end was truncated to an inch in diameter, corresponding to a point over the thyroidean isthmus. As regards consistence, it was comparatively hard at the base, but became elastic, very tense and fluctuating as the apex

was approached. Pulsation was well marked throughout the tumour, and there was a slight aneurismal *bruit*. The colour at the base was but an erythematous blush, which gradually deepened in hue from base to apex to red, then to a shining purplish shade.

In determining the character of the tumour it was patent from gross appearances that it was sanguineous in class, but as to its precise origin it was not so easy to decide. Yet considering the past history of the case, coupled with careful and patient examinations, both by my associate in practice, Dr. J. M. Greene (who saw the case with me from time to time) and myself, we determined it to be a *false aneurism*, resulting from the wounding of the right common carotid artery and internal jugular vein. The diagnosis was based chiefly on the following points tersely mentioned: that pressure on the carotid artery near its origin (which was effected by means of a small curved metallic rod with a short transverse piece at its curved end) did not lessen the volume of the tumour, but it did the pulsation, and by conjoint pressure in the artery, and over the superior portion of the internal jugular vein, not only did pulsation cease, but the tumour materially diminished in size.

When I took charge of the case it was evident that the tumour was in imminent danger of bursting, and it was necessary to decide quickly on a plan of treatment. The aneurism extending over the usual sites for ligating the common carotid artery and innominate arteries precluded any operative interference other than pressure, consequently this was attempted, but soon had to be abandoned on account of it having to be made acuminated at the *sterno-clavicular* articulation, which produced unbearable soreness of the tissues. The only course then left was purely a tentative one, with the exception of the use of a broad, equal, and firm support to the tumour, as much quietude of body and mind as possible, and heart sedatives. Under this treatment the aneurism ceased to increase, but it was evident that a thinning of the tissues at the apex of the tumour was in steady progress, which (about Nov. 18th) resulted in necrosis of the skin at the apex to about the size of a shilling, and rapidly increased to the size of a half dollar. Then there was a gradual separation of the dry slough around the edges, and a slight oozing of blood occasionally, but its admixture with salicylic acid in substance (which was used as a dressing) formed rather a firm coating, and prevented its rupture for several days. Anticipating the culmination of the matter at any moment the relatives and nurses were instructed with precision how to act in the event, and I might mention parenthetically in this connection that there have been but few patients who received more assiduous nursing than she from her relatives and friends, more especially from her brother, who watched over her bedside almost day and night, prepared to control the hemorrhage.

On the morning of Nov. 21st, at three o'clock, I was sent for in haste (living only a few blocks distant); I reached her in time to stop quite a free oozing from around the edges of the slough. The hemorrhage was kept in abeyance for only an hour, when, whilst standing near her lounge questioning my judgment as to the propriety of temporizing any longer, the question was quickly decided by a sudden welling up of blood, which afterwards broke forth in a stream the size of the slough. The amount lost in a moment's time was enormous. I hastened to her, and exerted pressure on the carotid artery and jugular vein, with the thumb and middle finger of my left hand extended, whilst with the right I "turned out the clot" from the tumour, and stuffed the then cavity with a small nap-

kin which happened to be lying near. These measures controlled the hemorrhage completely. I might remark *en passant* that the character of blood whilst flowing was noticed to be both arterial and venous, the demarcation of shades being quite apparent; and will also say that, on examining the clot which had been evacuated from the tumour, the base and edges seemed quite firm, and through its centre was a canal about a fourth of an inch in circumference, which had been tunnelled out by the stream from the carotid artery. Immediately after the stoppage of the hemorrhage, Dr. W. A. Evans, whose assistance I had requested, arrived just in time to see the patient pass into a violent convulsion on account of cerebral anemia; from which we thought at one time she would not rally, but by position and volatile stimulants she was relieved after a while. Soon after this Dr. J. M. Greene also came, and in consultation with the above-mentioned gentlemen, it was determined, as the tumour was gone, to search for the affected vessels and tie them. After waiting a while with patience to allow solidification of such clots as were supposed to have formed in the bloodvessels, we removed the napkin tampon, and afterwards very slowly the pressure, but were agreeably disappointed in noticing that there was not the slightest amount of hemorrhage, and were encouraged to again try pressure, which had before been so efficient in controlling it; consequently a compress was applied at and near the *sterno-clavicular* articulation.

Her treatment after this was absolute quietude in the recumbent posture for five weeks, sedatives to control the heart, concentrated nourishment and the smallest quantity of fluids—allowed to be taken—compatible with health. The valvular wound left was treated antiseptically with boracic acid, and healed by granulation in about four weeks. Compression over the site of the wounded vessels was continued for eight months by means of two elastic bands brought over the shoulder and breast and under the arms crossing each other over a compress made of a small sack stuffed with wool, the degree of tension being regulated by buckles on the bands.

When I last examined the neck in May, just before Miss H.'s departure for home, nothing abnormal could be detected, except perhaps a very positive degree of *bruit de diable* over and near the jugular veins; the lumen of both artery and vein seemed to have been re-established; and in a letter recently received from Dr. M. C. Duncan, of Madisonville, Tenn., dated Nov. 7, 1878, he says: "I examined Miss H.'s neck on the 30th of October last, and found it in an apparently healthy condition; her health is very good."

Reverting to that part of the history connected with the infliction of the wound, and the source of hemorrhage, though there is yet doubt about it, still I am inclined to hold the opinion that the bleeding *then* was from the jugular vein, the artery receiving a contused but non-penetrating wound from the offending body *en passant*. Although it is anatomically true that the carotid artery is between the jugular vein and trachea (the wound commenced over the last-named part), yet it is a well-known fact appreciated by military surgeons that arteries, on account of their cylindrical shape and resiliency, make almost miraculous escapes from wounds, whereas veins, being less elastic, and less tense, do not enjoy the same degree of immunity. The subsequent occurrence of the false aneurism was doubtless due to ulceration and consequent thinning of the arterial wall which

gave way coincidently with the recently formed and thin cicatrix of the vein under the increased blood-pressure whilst she was violently exercising in jumping a child.

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*Injury to Eye, with Loss of Lens; subsequently, Remarkable Acuity of Vision.* By H. S. OPPENHEIMER, M.D., Resident Surgeon at the New York Eye and Ear Infirmary.

M. C., male, æt. 32, a robust labourer, while chopping wood, was struck on the right eye by a flying stick. He presented himself at the Infirmary the next day, and was admitted as a patient on Dr. Callan's service.

The eye presented a slight cut at the tarsal edge of the upper lid, about its middle. The upper portion of the ocular conjunctiva was greatly ecchymosed. At the superior portion of the limbus, and following its curve almost exactly, was an irregular cut about five millimetres in length. In the lips of this wound could be seen some pigment, which was at the time thought to be a prolapsed portion of the iris.

The cornea was clear in most of its extent, and only around the wound showed fine, faintly-opaque lines. The anterior chamber was filled with blood, the iris and pupil invisible. V. = movements of hand. Tension — 2. No pain present. The treatment consisted of cold compresses, instillations of atropia, and the supine position in bed. No pain or inflammatory reaction ensued, the wound healed kindly, and at the end of two weeks after his admission the patient was discharged. At that time the anterior chamber was perfectly clear. At the level of the iris there was a web-like membrane stretched across the pupillary space, obscuring pupil and iris. Fundus still invisible. Tension about normal. One week after his discharge the patient returned. The membrane had disappeared completely, showing an entire absence of the iris, lens, and capsule.

A number of floating bodies could be seen in the vitreous. The fundus appeared normal in all its details, with the exception of a slight rupture of the choroid at its superior periphery. With + 3.4 spherical V. =  $\frac{20}{20}$  +. Some astigmatism present.

Oct. 2. Patient presents himself to-day—seven weeks after the accident—the media perfectly clear (excepting a small stationary opacity in the posterior portion of the vitreous), and a + 3.2 sph. with stenopaic apparatus, slit directed vertically, brings his vision up to  $\frac{20}{20}$ .

In this case the absence of all inflammation after such a severe injury to the globe, the small opening through which the iris, lens, and capsule must have escaped, the very rapid recovery after the extraction, which gave the patient vision of  $\frac{20}{20}$  + at the end of three weeks (a result which would be very gratifying so short a time after an extraction *lege artis*), and the ultimate astonishing vision of  $\frac{20}{20}$  (which is rarely attained after an operation under the most favourable circumstances) seem to me remarkable points of sufficient rarity and interest to justify publication.

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*A Case of Paroxysmal Hæmatinuria, with Unusual Irregularity of the Paroxysms.* By A. H. GOLET, M.D., of New York.

Attention was first called to this curious disorder by Dr. George Harley

in 1865 (*Med.-Chir. Trans.*, vol. xlviii.); and Roberts, in his excellent *Treatise on Urinary and Renal Diseases*, says:—

“Each paroxysm lasts from three to twelve hours, and it is noteworthy that no paroxysms occur at night; the urine voided before breakfast being invariably natural. . . . The temperature during the paroxysm was observed in three cases; in one case it was 96.1°; in another it was 96.6° during the cold fit, and five minutes after the voiding of the porter-like urine it had risen to 98.6°; in a third case the temperature, after passing the dark urine, was 103.2°; this last case is the only instance in which a febrile heat existed.”

The following case presents two unusual features, viz.: (1) the paroxysms did sometimes occur at night, and the first urine voided in the morning was not always natural; (2) the elevation of temperature was greater than has yet been noted.

CASE.—Mr. R., æt. 43, married, and of temperate habits, sent for me on the 9th of August, 1878, at which time he was suffering with pain in the region of the right kidney, and was passing dark porter-coloured urine. The history of the case was as follows: About the 19th of July he was taken with slight pain in the right loin, which increased in severity, and a day or so after he passed “bloody water” for the first time. He took some quack nostrum, which failed to benefit him, and then he concluded to take a trip to Richmond, Va., for his health. According to his statement his urine was “bloody” most of the time, but there were intervals when it was natural.

On his arrival in Richmond, about the 24th of July, he had an attack of retention, and called in a physician, who drew off his water, which was at the time “bloody,” and contained a few small clots. The introduction of the catheter gave him considerable pain, though he had very little in the kidney, and no tenderness or pain in the bladder. His physician suspected stone, but sounded for it without success. The catheter was used twice a day for three days, after which time the retention disappeared. His urine remained “bloody” all this time, but became clear under the use of *watermelon-seed tea*; and remained clear until the 7th of August, when it again became “bloody.”

He had an attack of malaria when about sixteen years old, but none since; and gonorrhœa about sixteen years since. Otherwise he has enjoyed good health.

When called to him, besides the symptoms already mentioned, he complained of chilly sensations, great depression and anxiety, and the bowels had not been relieved for several days. The temperature in the axilla was 104°, pulse full and strong. The urine was scanty, of a dark-red colour, highly acid, and contained a large quantity of albumen, which was thrown down in the form of a chocolate-coloured deposit with heat or nitric acid, the supernatant fluid being straw-colour. When agitated in a test-tube with a few drops of carbolic acid a pinkish coagula was produced which remained homogeneous. The urine, after being voided, if allowed to stand, separated into a brownish-red deposit, and a clear supernatant fluid which retained its deep-red colour.

Ordered a dose of Rochelle salt, a blister over the right kidney, and a mixture containing acetate of potash, sweet spirits of nitre, and tincture of hyoscyamus in camphor water, every two hours.

August 10, A. M. Considerably improved; pain entirely relieved. The urine was natural in colour, of normal reaction, and gave no coagula with

heat or nitric acid. Temperature  $102^{\circ}$ , pulse strong. Appetite good; could not retain the Rochelle salt. Ordered Seidlitz powder, and xv grs. quinia to be given at night, and v grs. in morning. The mixture every four hours.

11th, A. M. Very weak; urine changed again yesterday afternoon, and has remained "bloody" since. Temperature  $104^{\circ}$ . He did not retain the Seidlitz power, and was ordered pil. catharticae co. iv, quinia xx grs. at night, and v grs. in the morning. The mixture to be discontinued.

12th, 7 A. M. Was sent for, and found patient nervous and frightened. The pills had operated. The first urine voided this morning, though "bloody," was not quite so dark as that of yesterday, but acid in reaction. Temperature  $103^{\circ}$ ; ordered stimulus. P. M. The urine more deeply coloured, having the appearance of pure venous blood. Temperature  $103^{\circ}$ . Ordered x grs. gallic acid, to be repeated if necessary. Quinia as before.

13th, A. M. Urine passed at 11 o'clock is natural, but the first this morning was "bloody." Temperature  $103^{\circ}$ . Ordered fl. extr. of jaborandi in teaspoonful doses every two hours; gallic acid to be given when necessary. P. M. Was called in great haste; found profuse diaphoresis and retention. Urine was "bloody" again in afternoon, and he had taken x grs. of gallic acid. The introduction of the catheter was very painful, and its progress was arrested at the prostate gland, when the patient was seized with an irresistible straining, and on withdrawing the catheter a large clot was passed, followed by a quantity of "bloody urine" and smaller clots. Temperature  $103^{\circ}$ . Ordered x grs. gallic acid, to be repeated in the morning; the jaborandi discontinued.

14th, A. M. Though much improved, the urine has continued porter-coloured since last visit without any intermission, and contains small clots. Temperature  $101\frac{3}{4}^{\circ}$ . Ordered x grs. gallic acid three times a day.

15th, A. M. Urine was natural at 11 P. M. yesterday, but the first voided this morning was again porter-coloured, with a few clots. Temperature  $102^{\circ}$ . Gallic acid continued.

16th. Temperature  $100\frac{3}{4}^{\circ}$ . Gallic acid discontinued. Ordered xxx gtt. tr. of iron and v grs. quinia three times a day. The urine was natural yesterday afternoon, and until 6 o'clock this morning, when it was again porter-coloured. 10.30 A. M. Same, but without clots. 1 P. M. Same, with slight brownish deposit on standing, the supernatant fluid being red. 4 P. M. It is not so deeply coloured. 6 P. M. Amber-coloured with slight deposit on standing, which is only cloudy in appearance. 10 P. M. Urine voided more freely than before, but it is again porter-coloured.

17th, 3 A. M. Urine voided was natural. 9 A. M. Same, but with cloudy deposit; reaction normal. Bowels regular; appetite good. He is sitting up. Temperature  $101^{\circ}$ .

18th. Patient is improving. Urine is still natural, with only a slight opaque deposit. Temperature  $99\frac{1}{4}^{\circ}$ . Ordered iron as before, quinia iii grs., and strychnia  $\frac{1}{16}$  gr. three times a day. Temperature  $98\frac{3}{4}^{\circ}$ .

20th. Urine was porter-coloured for the first three urinations this morning, but has since been normal. Temperature  $99\frac{3}{4}^{\circ}$ . Iron, quinia, and strychnia as before.

24th. Patient called at my office and is doing well; no return of porter-coloured urine since last date. Complains only of a little soreness in the right lumbar region.

26th. Since the 20th he has had no return of the hæmatinuria, and is gaining strength. He continues the iron, quinia, and strychnia.



# BELLEVUE HOSPITAL MEDICAL COLLEGE, CITY OF NEW YORK.

## SESSIONS OF 1878-'79.

THE COLLEGIATE YEAR in this Institution embraces a Preliminary Autumnal Term, the regular Winter Session, and a Spring Session.

THE PRELIMINARY AUTUMNAL TERM for 1878-1879 will open on Wednesday, September 18, 1878, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures on special subjects, and daily clinical lectures, will be given, as heretofore, by the entire Faculty. Students expecting to attend the Regular Session are strongly recommended to attend the Preliminary Term, but attendance during the latter is not required. *During the Preliminary Term clinical and didactic lectures will be given in precisely the same number and order as in the Regular Session.*

The Regular Session will begin on Wednesday, October 2, 1878, and end about the 1st of March, 1879.

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JAMES R. WOOD, M.D., LL.D., Emeritus Professor of Surgery.

FORDYCE BARKER, M.D., Professor of Clinical Midwifery and Diseases of Women.

AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine and Clinical Medicine.

W. H. VAN BUREN, M.D., Professor of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.

LEWIS A. SAYRE, M.D., Professor of Orthopedic Surgery, and Clinical Surgery.

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WILLIAM T. LUSK, M.D., Professor of Obstetrics and Diseases of Women and Children, and Clinical Midwifery.

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### PROFESSORS OF SPECIAL DEPARTMENTS, ETC.

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LEROY MILTON YALE, M.D., Lecturer Adjunct upon Orthopedic Surgery.

A distinctive feature of the method of instruction in this College, is the union of clinical and didactic teaching. All the lectures are given within the hospital grounds. During the Regular Winter Session, in addition to four didactic lectures on every week-day, except Saturday, two or three hours are daily allotted to clinical instruction.

The Spring Session consists chiefly of Recitations from Text-books. This term continues from the first of March to the first of June. During this Session, daily recitations in all the departments are held by a corps of examiners appointed by the Faculty. Regular Clinics are also given in the Hospital and in the College building.

### Fees for the Regular Session.

Fees for Tickets to all the Lectures during the Preliminary and Regular Term, including Clinical Lectures	
Matriculation Fee	\$140 00
Demonstrator's Ticket (including material for dissection)	5 00
Graduation Fee	10 00
	30 00

### Fees for the Spring Session.

Matriculation (Ticket good for the following Winter)	
Recitations, Clinics, and Lectures	\$5 00
Dissection (Ticket good for the following Winter)	35 00
	10 00

*Students who have attended two full Winter courses of lectures may be examined at the end of their second course upon Materia Medica, Physiology, Anatomy, and Chemistry, and, if successful, they will be examined at the end of their third course upon Practice of Medicine, Surgery, and Obstetrics only.*

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT, Jr., Secretary Bellevue Hospital Medical College.

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ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of May.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent to the Editors.*

The following works have been received:—

Zur Behandlung einfachen Fracturen der Extremitäten mit Gyps-Hauf-Schienen. Von Dr. F. BEELY. Königsberg, 1878.

Über Sequesterbildung im Warzentheil des kinds. Von Dr. ARTHUR HARTMANN in Berlin. Wiesbaden: J. F. Bergmann, 1878.

Una Pagina di Deontologia Medica illustrata dal Dott. ANTONIO FEROCI. Pisa, 1878.

Etiologie et Prognostic de la Glycosurie et du Diabète. Par le Docteur JULES CYR, Médecine Consultant à Vichy. Paris: V.-Ad. Delahaye et Cie., 1879.

De Quelques Accidents de l'Épilepsie et de l'Hystero-Épilepsie. Par EMILIE BOVELL, Docteur en Médecine de la Faculté de Paris. Paris: A. Parent, 1877.

Medico-Chirurgical Transactions. Vol. LXI. London: Longmans, 1878.

Saint Bartholomew's Hospital Reports. Vol. XIV. London: Smith, Elder & Co., 1878.

The Croonian Lectures on Certain Points connected with Diabetes. Delivered at the Royal College of Physicians by F. W. PAVY, M.D., F.R.S., Phys. to, and Lect. on Medicine at, Guy's Hosp. London: J. & A. Churchill, 1878.

Papers on the Female Perineum, etc. By J. MATTHEWS DUNCAN, A.M., M.D., LL.D., Obstet. Phys. to St. Bartholomew's Hosp. London: J. & A. Churchill, 1879.

Notes on Rheumatism. By JULIUS POLLOCK, M.D. Second Edition. London: J. & A. Churchill, 1879.

The Brain and its Diseases. Part I. Syphilis of the Brain and Spinal Cord. By THOMAS STRETCH DOWSE, M.D., etc. London: Baillière, Tindall & Cox, 1879.

Elements of Comparative Anatomy. By CARL GEGENBAUER, Prof. of Anatomy and Director of Anat. Instit. at Heidelberg. Translated by E. JEFFREY BELL, B.A., Magdalen Coll., Oxford. The translation revised, and a Preface written by E. RAY LANKESTER, M.A., F.R.S., Prof. of Zool. and Comp. Anat. in Univ. College, London. London: Macmillan & Co., 1878.

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ARTICLE I.

ON INJURIES OF THE SCALP. By JOHN A. LIDELL, M.D., of New York.

WOUNDS of the cranial integuments should never be considered as trivial, or beneath the surgeon's notice and attentive care, since it not unfrequently happens that, even when they appear to be but slight, they are associated with dangerous lesions of the underlying parts, such, for example, as contusion of the cranium, linear or fissured fracture of the cranium, laceration of the middle meningeal artery, fracture of the internal table of the skull without corresponding fracture of the external table, contusion of the brain with ecchymosis of the pia mater, meningo-cerebral hemorrhage, encephalitis, cerebral abscess, etc. Seven fatal cases of "simple flesh wounds of the scalp" are returned as having occurred in the British army during the Crimean war. Concerning them the reporter remarks: "It is, however, believed that in all these cases some injury had been done to the contents of the skull, and, in all likelihood, most of them were cases of fracture or fissure of the cranium, which had not been detected." It is also stated that in one of them rupture of the longitudinal sinus and copious effusion of blood within the cranium were found after death. (*Med. and Surg. History of the British Army in Turkey and the Crimea*, vol. ii. p. 287.) Of the two hundred and eighty-two cases of incised wounds of the scalp recorded in the Medical and Surgical History of our own war of the rebellion, six terminated fatally. "Three died from some form of encephalitis directly resulting from the injuries received;" and "three died from complications." Besides these, "eleven were temporarily or permanently disabled," and, concerning them, Dr. Otis says: "Of those discharged for physical disability, or invalided, or pensioned, two suffered from mental aberration, others from vertigo, im-

perfect vision, headache, persistent pain at the seat of injury, ptosis, and amaurosis." (*Op. cit.*, Part First, vol. ii. p. 15.) Furthermore, many cases that have occurred in my own practice, or have otherwise come under my personal observation, some of which will hereafter be related, teach the same important lesson. Finally, it has passed into an aphorism among surgeons that "wounds of the scalp are attended and followed by more dangerous symptoms than wounds of the integuments on any other part of the body" (*Liston*).

But the integuments of the head exhibit certain peculiarities in respect to their anatomical structure and relations, which exert an important influence upon the symptoms, consequences, and treatment of the various traumatic lesions to which they are exposed. Now, these anatomical peculiarities, and the consequences thereof in a pathological point of view, should not be overlooked in this connection.

In the *first* place, the scalp is firm, dense, and laminated in structure. It consists essentially of a cutis that is very thick and very strongly adherent to the occipito-frontalis muscle or its tendinous expansion, but more especially to the latter, by means of a dense and somewhat ligamentous connective tissue, and these parts are so intimately blended thereby that it is not easy to separate them in dissection. The natural consequence is that collections of purulent matter (abscesses) are but seldom formed in the substance of the scalp itself; and when they occur beneath it, do not readily secure an outlet externally by the ulcerative process, therefore requiring, not unfrequently, to be evacuated by incision, and, if they are not opened in that way, give rise to troublesome and even alarming symptoms. Another important consequence of this remarkable density of the scalp is that when it happens to sustain a solution of its continuity it proves less tolerant of the employment of sutures in the dressing thereof than the tegumentary tissues on nearly every other part of the body.

In the *second* place, the scalp is but very loosely attached to the pericranium by means of connective tissue; and from this circumstance it results that when purulent matter is formed beneath the scalp, as happens not unfrequently in cases of erysipelas of the head, this matter is liable to become diffused over a large space in a short time, and, therefore, should be promptly evacuated by free incisions carried quite down to the pericranium. Oftentimes in cases of this disease, the patient cannot be saved by any other means.

In the *third* place, the scalp is highly vascular, wherefore it bleeds freely when wounded. Moreover, the contraction and retraction of the ends or mouths of its vessels when divided are, to considerable extent, prevented by the denseness of the tissues with which they are immediately surrounded, and therefore traumatic hemorrhage from the scalp is much less likely to cease spontaneously than traumatic hemorrhage from the integuments of any other part of the body; and, consequently, it is necessary

to employ surgical means in order to arrest tegumentary bleeding in this region much oftener than elsewhere. Besides, the scalp is less likely to slough, even when bruised and torn to great extent, than many other parts, because of the copiousness of its blood-supply, which results from the multitude of its vessels and the free inosculation of their terminal branches.

In the *fourth* place, the bloodvessels of the scalp communicate freely with those of the cranium and dura mater, and therefore an inflammatory disorder, for example, erysipelas, may readily spread from the surface of the head through the skull to the membranes of the brain.

In the *fifth* place, the scalp is very copiously supplied with nerves, both sensitive and motor, and from this circumstance it sometimes happens that injuries of this part, especially in young and irritable constitutions, give rise to obstinate neuralgias. Occasionally, also, wounds of the scalp are followed by tetanus of a fatal character, and a case of this sort will be related in some of the following pages.

The several traumatic lesions to which the scalp is exposed are: 1, *contused* wounds or *bruised*; 2, *lacerated* wounds; 3, *lacerated* and *contused* wounds; 4, *gunshot* wounds; 5, *incised* wounds; 6, *punctured* wounds; 7, *poisoned* wounds.

1. *Contusion of the scalp* is a form of injury that is often met with, especially in the persons of young children, for they are strongly prone by nature to bruise their heads by falling down and in other ways; and, generally, it is not attended with disastrous consequences, unless the constitution of the subject happens to be diseased, or the external injury proves to be associated with some serious lesion of the more deeply-seated parts, such, for example, as contusion of the brain, fracture of the skull, etc. The last named circumstance, however, occurs with sufficient frequency, especially in adults, and in children that are partly grown up, to make it the duty of the surgeon to examine all cases in which the scalp is contused with thoroughness and attentive care; and, in cases of children, even when no structural lesion of the cranium or the brain is revealed by such examination, he should inform the parents and attendants of the little patient, with regard to the possible consequences of the injury, such, for example, as consecutive inflammation of the membranes of the brain, cerebral abscess, secondary extravasation of blood within the cranium, etc., so that their attention may the more readily be excited by the premonitory symptoms of danger, so that the headache, restlessness, and fretfulness of cerebral irritation may not be mistaken by them for viciousness of temper, and thus the surgeon may receive from those charged with the care of the little patient timely notice of impending mischief, and be promptly brought to its relief. A thorough comprehension and appreciation of the premonitory symptoms of the consecutive disorders of the head which result from violence, may lead to the preser-



vation of some lives which would otherwise be lost, and unquestionably it would redound greatly to the credit of our art. With proper attention to this subject it would not happen so often as it has done heretofore that patients discharged from our hospitals and infirmaries nominally cured of scalp wounds, either suffer and even die at our homes, some time afterwards, from the consequences of the original injury which had not been forestalled and removed, or are compelled to return to the hospital for that treatment which they should have received in the first instance.

Rupture of some of the cutaneous or subcutaneous bloodvessels always occurs when the scalp is contused. Generally these lacerated vessels are small in size, the quantity of blood extravasated from them is also small, and infiltrated into the substance of the scalp or into the connective tissue underlying it at the place of injury; and, therefore, the amount of the tumefaction is usually not great. It is in this way alone that ecchymosis of the scalp is produced in a very large proportion of the cases of contused wounds of the head which come under the surgeon's notice. But, not unfrequently it also happens, especially when the contusing force is great and the bruise severe, that one or even more than one arterial twig of considerable size is crushed or ruptured by the blow, and blood in considerable quantity is extravasated therefrom into the substance of the scalp or into the loose connective tissue beneath it; and, in exceptional instances, beneath the pericranium also, *i. e.*, between that membrane and the skull. Thus, a tumour containing blood is formed at the place of injury; and it is produced either slowly or rapidly according to the size and number of the ruptured vessels. Now, this kind of tumefaction of the scalp may grow to a considerable size. It not unfrequently becomes as large as a hen's egg or even an orange. If the temporal muscle be the seat of the bruise and the extravasation of blood occur mainly beneath the temporal fascia, in the temporal fossa, the swelling is apt to be very hard or tense to touch, and considerably flattened in shape, because it is firmly covered over and bound down by that dense fascia. If blood escapes in large quantity in that situation, as, for example, when some large branch of the temporal artery is ruptured, the effusion may not be restrained within the limits of the temporal fossa, but, after filling up this fossa, it may burrow downwards along the fibres of the temporal muscle beneath the zygoma to the insertion of that muscle, and thence following the ramus of the lower jaw down to its base, it may accumulate there, and so cause great tumefaction in that locality far distant from the seat of injury. The following case is in point:—

CASE I.—A robust looking, but near-sighted man, aged 43, while walking home from business in a snow-storm, at a late hour on the night of Friday, March 22, 1867, was suddenly set upon and struck a violent blow on the left temple by an unknown person, with some blunt-faced instrument having four corners, supposed to have been a slung-shot. The night was dark and gusty, the air was full of whirling snow, and the walking

difficult from the presence of much sand-like snow on the pavement, often drifted into heaps, and there locomotion was harder still. Only one blow was struck, and his assailant instantly disappeared in the storm and darkness. In fact, he did not see his assailant at all. He heard a strange hissing sound in the air near his head for a moment, and then suddenly felt the impact of something on his left temple, like the kick of a horse. The blow staggered him and turned him partly round, but did not knock him down. With some difficulty he kept his feet, and on looking for his assailant he heard the sound of his retreating footsteps. The wounded man now felt bewildered and dizzy; but realizing that he was severely, perhaps dangerously, hurt, turned his footsteps immediately to the house of a friend who lived on the same block, instead of continuing his way home, which was more than a mile distant. As he made his way towards safety he noticed that his right leg was semi-paralyzed, *i. e.*, considerably weaker than the left one; still he did not fall down, and, aided by his cane, soon reached his friend's house without any other assistance. There ice was at once applied to the seat of injury, *viz.*, the left temporal region, and this application was continued all night. The bruised part was already a good deal swollen. He was oppressed with a sense of immense tension or pressure beneath the left temporal fascia. He also felt as if the anterior part of the left cerebral hemisphere had been destroyed, and as if this portion of his head were empty. On examining his hat—a tall silk one, which was pulled far down over his eyes at the time of the assault—it was seen that the force of the blow had been largely expended upon the hat itself, and thus, in all probability, it came to pass that he was not killed on the spot. The hat-band was found crushed and disintegrated by the force of the blow through a space more than an inch long, to such degree that it parted spontaneously. The shape of the weapon was also found imprinted upon the brim and body of the hat. Careful examination of the place of injury failed to reveal any fracture of the skull, although an imprint of the weapon on the bruise, corresponding to that on the hat, was readily detected. It was nearly two inches square. Towards morning it was noticed that a soft swelling was forming in the left parotid region, and beneath the angle and base of the lower jaw on that side in parts which had not been hurt at all.

*March 23.* The left eyelids are considerably swelled and blackened from sanguinolent infiltration. The tumefaction beneath the angle and base of the lower jaw on the left side has attained a great size and interferes a good deal with the act of swallowing. It is estimated to contain over eight ounces of blood which has trickled down from the place of injury along the course of the temporal muscle, behind the zygoma, and so on down the ramus of the inferior maxilla. The feeling of vacuity as to the anterior part of the left cerebral hemisphere, mentioned above, was thought to be due to contusion of the cerebral convolutions lying beneath the place of injury. The other symptoms of cerebral concussion had disappeared, and the partial paralysis of the right leg had also passed away. Ordered quietude, a spare diet, the administration of a saline purgative, and the continuance of cold applications to the seat of injury.

On the 25th and 26th there was considerable headache, which was most marked in the neighbourhood of the bruise, together with some fever. Ordered magnesia sulph.  $\mathfrak{z}\text{j}$  on each of these days, with aconite in full doses, and the bad symptoms disappeared.

On the 27th the integuments covering the swelling in his throat, be-

neath the angle and base of the lower jaw on the left side, became discoloured by infiltration of blood from within, and this discoloration of the skin increased during the next day or two.

On the 30th it was observed that this sanguinolent swelling in the throat was decidedly softer and of diminished size. Afterwards, as the process of absorption went on, it steadily grew less in bulk, and thus, in a short time, it disappeared. The patient, however, was for a long time troubled with the sense of vacuity in the anterior lobe of the left cerebral hemisphere above mentioned, with traumatic neuralgia of the head and face, and the injured part of the left temporal muscle took on atrophy of a permanent character.

*Comments.*—This case serves well to show an important fact not generally known, and perhaps never before set down in print, namely, that a strong contusion of either temporal muscle may be attended with the formation of a large sanguinolent swelling in the throat beneath the angle and base of the lower jaw on the corresponding side. On this point the history of this case leaves no room for doubt. The neck itself sustained no injury during the assault. The only part struck was the left temporal region. There the swelling first appeared, and there it longest remained. There the imprint of the weapon was found, and to that locality the consecutive tenderness was confined.

This case also serves well to illustrate the plan of treatment which contusion of the scalp, when severe, usually requires. The bruised part should be bared by cutting off the hair. When the occurrence of internal hemorrhage is feared, the ice dressing should be applied. When the contusion is only inflamed, *i. e.*, painful, hot, and tender, it should be kept wet with some discutient lotion, such, for example, as rectified spirit and water (part 1 to 3), or liquor plumbi subacetatis dilutus, or the lead and opium wash, or the well-known compound solution of muriate of ammonia. If the patient complains of headache it will be advisable to administer a saline cathartic, for example, one ounce of Epsom, Glauber, or Rochelle salts; and if he is also feverish, give saline drinks, such as the neutral mixture of the pharmacopœia in half-ounce doses, for an adult, with one minim of Fleming's tincture of aconite root, every four hours. Absolute quietude and a meagre diet should also be enjoined. When consecutive inflammation of the brain or its membranes is threatened, the employment of these therapeutic agents, together with the application of the ice-bag to the head, is very necessary. If the tumour suppurates, or if the blood contained in it putrefies, it should be promptly evacuated by a suitable incision. The occurrence of suppuration may oftentimes be recognized by the tumour's acquiring a pointed appearance, and becoming soft or even fluctuating in feel at the place of pointing. After the swelling has been emptied by incision, it is generally advisable to apply a warm poultice of ground flaxseed. If the discharge be offensive in smell, a disinfectant, for example, liquor sodæ chlorinat., in suitable quantity (from  $\text{ʒiv}$  to

3vij), should be mixed with each poultice, and the poultices themselves should be renewed at intervals of six or eight hours. If the discharge is putrid in character, the part should be dressed with a solution of carbolic acid in water (part 1 to 40), applied on lint and kept covered with oiled silk or gutta-percha cloth to prevent evaporation, instead of poultices. This antiseptic dressing should also be renewed at intervals of six or eight hours. We have just stated that when the sanguinolent swellings of the scalp, which are produced by contusion, suppurate, or their contents putrefy, they should be opened by the surgeon. It is our duty to state further, that under no other circumstances whatever should these bloody tumours be incised, since unhealthy, tedious, and troublesome suppuration is almost sure to follow (*Liston*). If phlegmonous erysipelas supervenes upon a bruise of the scalp, it should be treated in the same way as when it occurs spontaneously in the same part. At an early period suitable incisions should be made in the boggy, tumefied scalp for the purpose of relieving tension, evacuating putrescent sero-sanguineous matter and pus as soon as formed, and liberating sloughs of the connective tissue. At the same time a strongly supporting and tonic plan of constitutional treatment should be employed. Moreover, it should not be forgotten that erysipelas occurs more frequently in the head than in any other region of the body.

Again, the case just related serves well to illustrate some important consequences which may follow contusion of the scalp. As the bruised part regained its normal condition, the patient became a victim of *severe neuralgia*. The pains thereof were not confined to the place of injury, but presented a migratory character, and were experienced, at some time or other in the progress of the case, in nearly all of the parts supplied by the fifth pair of nerves on the left side of the head. But the paroxysms were observed to be more severe—to occur more frequently and to last longer—at the place of injury than elsewhere. Next to it the parts supplied by the inferior dental nerve of that side were the favourite seat of these pains. Like the neuroses in general they were much aggravated by fatigue or over-exertion. Whenever they became intense, the parts involved by them appeared to be warmer than natural. The application of cold water and ice to these parts, especially to the place of injury, was very grateful to the patient, and afforded more relief than anything else that was tried. This traumatic neuralgia, after continuing three months in full blast, then gradually wore away and ultimately disappeared. We may with propriety state in this connection that contusions of the scalp occurring in girls and young women sometimes occasion neuralgic pains in the injured part, and the vicinage thereof, of a severe character. Moreover, these pains are apt to prove extremely rebellious to treatment. *Erichsen*, however, mentions two cases which he had seen, wherein this affection, after lasting a considerable time, gradually disappeared; and

states that, in obstinate cases of this disorder, incisions down to the bone are said to have sometimes proved beneficial.

Finally, *atrophy of the bruised part* may be reckoned among the remote consequences of severe contusion of the scalp. Thus, in the case just related, the force of the blow was so great as not only to rupture some important branch of the temporal artery, but also to crush or disintegrate the substance of the temporal muscle itself through a space corresponding to the imprint of the weapon on the scalp. The bruise was attended with much tumefaction, as already stated. But as the swelling subsided the injured part of the temporal muscle wasted away and disappeared to such an extent that, five months after the injury, a hollow or sunken spot of considerable breadth and depth existed at the place of injury, which an inexperienced or inattentive surgeon might readily attribute to depression of the bone, instead of the true cause. Moreover, this atrophy of the injured part of the temporal muscle was never recovered from, and the deformity occasioned thereby was permanent. And now, more than eleven years after the assault, this part of the temporal muscle appears to be shrunken down to but little more than a thin plane of ligamentous or aponeurotic tissue.

There is another deceptive condition of the scalp, the result of fresh contusion, which the writer has several times met with, that should here be mentioned. It is not accompanied by much swelling, nor by the extravasation of much blood. In it the deep laminae of the scalp are disintegrated and cut through, as it were, by violence of the contusing force, while the external laminae remain entire. The place of injury is soft in the middle, but its edges are hard and sharply defined, and a superficial examination is liable to impart, to the sense of touch, the impression that the skull is fractured, and that a portion of it is depressed. If, however, the examination be carefully made, the surgeon will have but little difficulty in satisfying himself that the bone is not broken and that it occupies a normal position. Mr. Erichsen states that he has occasionally seen this condition of bruised scalp in children in whom that portion of integument is naturally soft and spongy. The writer, however, has met with it not only in children, but in adults also.

Before leaving this topic it is our duty to state that contusion of the scalp when it is produced by a gunshot projectile, but especially when it is produced by a cylindro-conoidal bullet, is, for the most part, an injury of very serious import. The correctness of this statement was abundantly shown by the experience of our army surgeons during the late war of the rebellion. On this point Dr. Otis remarks as follows: "Gunshot contusions of the head without breach of surface, of sufficient severity to cause ecchymosis, were invariably attended by commotion, concussion, or intracranial extravasation, and are classified and will be described in connection with injuries of the encephalon." (*Med. and Surg. Hist. of the War of the*

*Rebellion*, part 1st, vol. ii. p. 93.) These views also fully accord with my own personal experience. This subject will receive further elucidation in the latter part of this essay, while discussing the injuries of the cranial integuments which are produced by fire-arms.

2. *Lacerated and contused wounds of the scalp* very frequently come under the surgeon's notice. They are produced by a great variety of the casualties to which man is exposed; for example, by falling down, by blows on the head inflicted with blunt and angular instruments, by the kicks of animals, by being thrown from carriages in motion, by being struck on the head by falling bodies, such as bricks, tiles, fragments of stone, tackle-blocks, and by being hit with the missiles of war. This form of injury is often associated with certain obscure and dangerous lesions of the cranium, of the membranes of the brain, and of the brain itself, which have already been referred to on a previous page. The surgeon should, therefore, when called to a case of contused and lacerated wound of the scalp, make a most thorough examination of the wound and of the patient, at the outset, for the purpose of determining, if possible, whether any of the parts beneath the scalp have been injured. He should also be very cautious in stating the prognosis, unless he is perfectly certain that the deep-seated parts, such as the cranium, the intra-cranial blood-vessels, the meninges, and the brain-substance itself, are uninjured. and, to the end of keeping himself informed on this point, he should attentively watch the progress of the case.

This form of scalp-wound varies much in size and shape in different instances. Sometimes it is so small as to attract but little notice, while in other cases it is so large that the cranial integuments are extensively detached from the bone, perhaps the ears also are torn off. The following case presents us with a good example of an extensive scalp-wound of a contused and lacerated character:—

CASE II. *Caused by being thrown from a wagon: Extensive Denudation of Skull; Recovery; Wound united by Adhesion.*—Mr. D., aged about 60, a farmer, always strong and healthy, was run away with by a pair of horses, and thrown from his wagon with great violence, on the afternoon of October 20th. He fell head-foremost to the earth, and thus received a severe wound of the scalp. He was picked up in an insensible condition, from concussion of the brain as the result proved, and carried on an unlinged door to his home, a distance of half a mile, where I saw him about six hours afterwards. The symptoms of shock had then disappeared; his skin was warm; pulse 90, and strong; and he had traumatic delirium of a talkative, busy character. At first I thought he had been indulging in strong drink to excess, and that the excitement produced by it had not yet subsided, but satisfied myself on inquiry that such was not the case. His face was flushed, eyes bright, and the pupils were contracted. He was not paralyzed in any part. I found his head tightly bound with a handkerchief, and learned that it had been so applied, with a thick compress underneath it, for the purpose of arresting the outflow of blood from the wound, which was said to have been profuse. Without delay I re-

moved this dressing, and the hemorrhage immediately returned. It proceeded from two branches of the temporal artery, which had been severed. I secured these with ligatures, and thus stopped the bleeding permanently. Both the proximal and distal orifices had to be tied. The wound was situated on the right side of the head, over the anterior part of the parietal and upper portion of the frontal bone. The scalp was cut and torn completely through to the bone. The wound was irregularly crescentic in shape. The flap of scalp embraced by it, which, by the way, was about three inches in length by four inches in breadth at its base, was stripped off from the skull, everted, and hanging down, supported only by its attached margin or base. The wound contained much sand and dirt, and there were many particles of gravel stuck in the raw surface of the everted flap of scalp. Having arrested the bleeding I proceeded next to cleanse the wound. I washed it gently but thoroughly with warm water. Thus the dirt and clotted blood were gotten rid of. I then carefully picked out all the particles of gravel and sand that were sticking in the flesh. His head being bald, no trouble was occasioned by the presence of hair. The skull, which was bare in the wound and therefore could readily be examined, had not sustained any appreciable injury. The scalp had been extensively torn and bruised, as stated above, by the glancing of his head off from a stone against which it struck when he fell, as I subsequently ascertained on examining the spot where the injury was inflicted.

Having gently dried the wound with a soft linen napkin, and brought out the ligatures, I coaptated its edges as carefully and accurately as possible, for the purpose of avoiding scar in the cure, which was a matter of some importance, because the patient was bald. I secured the coaptation at these points with silver wire sutures, and with several long narrow strips of adhesive plaster applied on the intervals between them, but did not put on a compress nor a bandage. Ordered one ounce of magnesia sulph. to be administered every four hours, until his bowels should freely move, and one minim of Fleming's tincture of aconite root to be taken every second hour, until my next visit. He was also directed to have cloths wet with cold water kept constantly on his head, to have no food besides water gruel, and to be disturbed by light, and noise, and talking, and motion as little as possible. During the night his bowels acted freely, and towards morning he slept soundly.

On the following day, in the afternoon, when I saw him again, he was free from delirium, but had no recollection of anything that occurred since the accident; he still had some headache. Directed the aconite to be continued at intervals of four instead of two hours. The scalp-wound was doing remarkably well, there being but little redness or swelling.

He progressed towards recovery without an unfavourable symptom. The wound united by primary adhesion. There was no suppuration whatever, except at the site of the ligatures, and there only a few drops. At the end of the third day the silver wire sutures were withdrawn. They had produced no irritation whatever. At the same time the ligatures were extracted (pulled out), and afterwards the wounded part was dressed with adhesive plaster alone. I saw and examined this patient about six months after the accident. He was then in excellent health, not troubled with any head-symptoms, and the scar was even less apparent than I had expected it to be, which was very slight indeed.

*Comments.*—The history of this case also seems pretty well to illustrate the principal points in the treatment of contused and lacerated wounds of

the scalp. The indications to be fulfilled by the surgeon in the management of this form of injury are the following:—

*First.* The suppression of hemorrhage. In the case just related it was necessary to tie several wounded vessels in order to stanch the bleeding. Compression had been faithfully tried for several hours, but without success, a circumstance due in great measure to the exceeding vascularity of the scalp on the one hand, and to the fact that, from the denseness of its structure, the open mouths of the wounded vessels cannot contract and retract, and finally become plugged up with blood-clot, as readily as in almost any other part of the integuments. It was also found to be necessary, in this case, to tie both the proximal and distal orifices of the severed vessels, because of the free communication (anastomosis) which exists between the terminal branches of the arteries in the scalp, between those distributed on the opposite sides, *i. e.*, across the median line, as well as those belonging to the same side of the head. The several procedures which may be employed for the arrest of hemorrhage from scalp wounds are compression, torsion, ligation, acupressure, the use of styptics, and the actual cautery. If the blood escapes in jets and torsion fails to arrest it, a ligature should generally be applied without delay. Indeed, as the ligature is one of the most ancient, so it is one of the most convenient and reliable of all the means at our disposal for the suppression of hemorrhage. If the bleeding be parenchymatous in character, and not attended with sloughing, the application of styptics, such as liquor ferri persulph., together with compression, will generally suffice. But if parenchymatous hemorrhage occurs from a sloughing wound, the actual cautery will often be required. In cases of non-parenchymatous hemorrhage where the bleeding is profuse, the parts sloughy, soft, and much swollen, so that the application of ligatures in the wound would be extremely difficult, if not impossible, it is advisable to make trial of acupressure before proceeding to tie the main arterial trunk at a distance from the injured part.

*Second.* The wound should be thoroughly cleansed and carefully searched for the discovery of any foreign bodies, which should always be completely removed. In the case related above, the wound, as soon as the bleeding was stanchd, was gently washed out with warm water, and then all the particles of sand and gravel still remaining therein were carefully picked out with forceps, one by one.

*Third.* The hair should be cut off and the scalp shaved to a distance of several inches from the wound, unless the patient is bald, in order to facilitate the application of dressings, promote cleanliness, and thus hasten the cure.

*Fourth.* The edges of the wound should be accurately coaptated and retained in that position by the employment of suitable dressings. In the foregoing case, having gently dried the wound with a soft napkin, we brought the edges together in such a way as to restore as nearly as possible



their original relations, but finding that strips of adhesive plaster, however numerous applied, would not suffice to maintain this coaptation, we employed the interrupted suture at three points, using silver wire instead of silken thread, because it seemed less likely to irritate the scalp, and because it would enable us to make a neater coaptation. Furthermore, the sutures and the ligatures were removed from the wound, as soon as the objects for which they were employed had been accomplished, and the flap was then supported externally by strips of adhesive plaster alone. Thus, the wound was always lightly dressed. Thus, also, the precepts of modern surgery were carefully followed out, and we were rewarded for our pains by obtaining a speedy and a gratifying cure for our patient. One of the greatest practical surgeons who ever lived has said: "If a large flap of integument is detached, it should be replaced, and retained as nearly as possible in its natural situation; and if, for this purpose, strips of adhesive plaster and methodical compression prove insufficient, it will be necessary to employ a very few points of interrupted suture; these, however, must be removed at an early period, that is, when either adhesion or suppuration has commenced, and ought, if possible, to be altogether dispensed with, being apt in this situation to produce injurious effects by their irritation." (*Liston.*) Concerning the employment of sutures in treating incised scalp wounds, Dr. Otis, the surgical historian of our war of the rebellion, remarks, in view of the experience on this point collected during the war, as follows: "There can be no doubt that exaggerated apprehensions have been entertained with respect to the employment of sutures in wounds of this class; but, as the scalp has but slight elasticity, and retracts but little after division, stitches are rarely indispensable. Neudörfer makes the practical observation that when wounds of the scalp are approximated by adhesive strips, the lips are inverted, and the healing of the wound is long delayed by the growth of the hair. On this account he greatly prefers to unite such wounds by points of sutures. Hennen, and Guthrie, and Adams also sanction the employment of sutures in scalp wounds where there is much retraction of the edges. Whatever the mode of coaptation adopted, the importance of leaving sufficient intervals for the escape of discharges was generally recognized." (*Op. cit.*, part first, vol. ii. p 16.) Liston, however, has most clearly laid down the indications for the employment and the rules for the management of interrupted sutures in scalp wounds.

Another interesting feature of our case is that notwithstanding the great extent to which the scalp was torn and bruised, no part of it was lost by sloughing. This circumstance shows that the integuments of the head are endowed with a high degree of vitality, and that in all similar accidents, the detached scalp, even when torn more extensively and bruised more severely, ought never to be cut off by the surgeon at the outset, but

that it should be left for nature to determine how much if any part thereof must be destroyed.

Again, it is worthy of remark, that, although the cranium in this instance was extensively denuded of its periosteum by the accident, no part of it was subsequently cast off by exfoliation. This circumstance shows that the detachment of the pericranium does not of necessity destroy the vitality of the denuded bone, or any lamina thereof, and that the bones of the skull may, at least for a time, receive a sufficient supply of blood from other sources to maintain their vitality intact, irrespective of the pericranium. This important fact in surgical pathology did not escape the notice of our predecessors, and was by them turned to practical account more than one hundred years ago. Thus, Quesnay, after reciting a case treated by M. Malaval, wherein the pericranium was extensively stripped off from the frontal bone of a lad, aged twelve years, by the kick of a horse, notwithstanding which the wound was healed in a week without any unpleasant symptoms, and after relating two additional cases, that occurred in the practice of the same surgeon, wherein the pericranium was extensively separated from the skull by an extravasation of blood, the result of contusion, without any ill effects to the bone, says: "We will merely remark by the way, that these three observations of M. Malaval may serve to give confidence to some who may hesitate about reapplying to the bone the detached flaps of integument, especially when contused; for we see that this practice, which has for a long time received the approbation of the highest authorities, succeeded perfectly here, although the wounds were contused ones." (*Memoirs of the Royal Academy of Surgery of France*; selected, pp. 17, 18.) I have discussed this point in the history of our cases at some length, because the doctrine which ascribes to the periosteum an office or a commanding influence in the genesis and necrosis of bone that it does not possess, is by no means a harmless fancy. In practice it is liable to bear mischievous fruits, for in cases where this membrane is detached from the bone, the latter being uninjured, it may lead the inexperienced surgeon to harm his patient by adopting an erroneous plan of treatment, or to bring discredit upon himself by prognosticating results which will not follow.

Furthermore, our patient was affected with traumatic delirium of a sthenic type. He exhibited well-marked symptoms of cerebral irritation, resulting, no doubt, from the violent concussion to which the substance of his brain had been subjected, and showing themselves in the period of reaction that follows the symptoms of shock with which cerebral concussion, when severe, is always attended. For the relief of this disorder of his brain saline purgatives in full doses, together with aconite, were administered, with a most happy result. My own experience has fully convinced me that aconite is a most useful sedative in all acute disorders of the brain of a sthenic type, and on this point my views accord with those

of Solly. (Vide Solly *On the Brain*, pp. 356, 363, Am. ed.) The history of the foregoing case, then, serves to illustrate the great value of saline purgatives and aconite, when combined with quietude and a low diet, in treating the sthenic forms of cerebral irritation.

Our patient also lost a considerable quantity of blood by hemorrhage from the wound, without any bad consequences; indeed, it is probable that he was even benefited thereby. This circumstance should teach us not to undervalue bloodletting, both general and local, as a remedial measure in similar cases.

But the hemorrhage from a lacerated and contused wound of the scalp of only small extent may be so great as to prove fatal. Death from hemorrhage actually occurred in the following case wherein the left temporal artery was accidentally penetrated by a wound of this sort:—

Mr. Douglass, a barrister of the Middle Temple, aged 58, was on Christmas morning found dead in his chambers, Garden Court, Middle Temple, through the loss of blood from a wound in his head inflicted by falling against the small key of his book-case. Mr. Hutchinson, of Chancery Lane, who examined the body, said that if he had had timely assistance the hemorrhage could have been stopped and his life saved. Deceased, who was subject to epileptic attacks, fell, it is supposed, during one of these seizures, with his head against the key which opened the left temporal artery. He was heard to fall at 7 A. M., and found dead at 9 the same morning. (*Eve's Surgical Cases*, p. 747; also *Lancet*, 1852.)

3. *Gunshot Wounds of the Scalp*.—The solutions of continuity belonging to this category are, in a large majority of instances, essentially contused and lacerated in their nature. They are not unfrequently produced by spent balls impinging against the skull, and, in such cases, the features which belong to contused wounds of the same part are apt to predominate. If a small-arms projectile strikes while moving at a very low rate of speed, its force may not be sufficient to break the skin, and in such case the injury of the scalp consists entirely of contusion. All surgeons much experienced in warfare have probably met with instances of this sort. The writer has seen a considerable number of them. If the velocity of the projectile is somewhat greater, the force of its blow may suffice to break the skin without penetrating it, and then the wound possesses a mixed character of contusion and laceration, with the first-named element predominating. But when the projectile strikes the head obliquely while moving with considerable velocity, and at the same time does not injure the skull, it may tear a ragged groove or furrow in the integuments. In such a wound the laceration of the injured part becomes a more prominent feature than the contusion. When the velocity of the projectile is very great, the furrow in the scalp, produced by it, is usually much smoother, and bears considerable resemblance to an incised wound. Generally, other things being equal, the greater the velocity of the projectile in cases of gunshot wound of the scalp, the stronger becomes the resemblance to solutions of continuity produced by cutting instruments. It is obvious that in such wounds the contusion is a very subordinate element, and that

the laceration constitutes the principal feature. Pure contusions of the scalp on the one hand and pure lacerations on the other must, however, be considered as only the exceptional results of gunshot injury; for, in a large majority of instances, as already stated, these wounds have been found to partake of a contused and lacerated character.

The following case presents us with an example of such a wound of the integuments of the head, and will serve to illustrate the nature, progress, and termination of this form of injury:—

CASE III. *Gunshot Wound of Scalp; Cranium not injured; Recovery.*—Lieut. G. P. B., Co. G, 2d North Carolina Cavalry (Confederate), aged 23, was wounded in the head by a small-arms projectile and captured, June 20, 1863.

On the 24th he was brought to the Stanton Military General Hospital, at Washington, of which the writer was then the surgeon-in-charge. A furrow or groove which the bullet had ploughed along the scalp, was found on the left side of his head at the upper part thereof. This wound or furrow was about three inches long, with elevated, gaping sides or edges, and presented a somewhat ragged appearance. It was moderately inflamed and dry looking, the discharge being very scanty. On careful examination it was found that the projectile had torn through the scalp and uncovered the pericranium, at the middle part of the wound, but had not done any perceptible injury to the osseous tissue. The bone was not bare, nor indented, nor roughened, and the pericranium itself was not ecchymosed. His general condition was good. For treatment, directed the hair to be removed through a space of several inches about the wound, a water-dressing to be applied, his bowels to be kept loose with saline purgatives, his diet to be light and unstimulating, and specially enjoined upon him to abstain from exercise or unnecessary physical exertion, and to avoid all excitement.

June 29. Wound presents an ash-coloured, sloughy appearance; its edges are considerably swelled; discharge thin, dirty-looking, and offensive in smell. He also complains of headache, has had slight rigors, and is feverish. Prescribed liquor sodæ chlorinat. dilut. (1 part to 12 of water) to be applied on a compress as a dressing for the wound, the compress to be kept constantly wet with the lotion, and morphia sulph. gr. one-sixth to be taken at night as he complained of inability to sleep. Directed the progress of the case to be closely watched with a view to determine whether the constitutional symptoms were due to malarial intoxication, or to some obscure inflammatory disorder of the parts beneath the wound, although we were disposed to accept the first-named explanation.

July 1. The wound presents an improved appearance; it discharges freely a puriform matter, the slough is melting away, and granulations are beginning to appear. Patient's general condition also decidedly better, although he has slight diarrhœa. Ordered the wound to be poulticed with ground flaxseed, with a view to promote the separation of the dead tissue.

8th. He took a chill believed to be of malarial origin. Prescribed quinia sulph. grs. v, to be given three times a day, and a water dressing to be applied to the wound instead of the poultice. The wound itself was now clean and granulating satisfactorily, the discharge moderate in quantity, and consisting of thick, purulent matter.

20th. Patient improving rapidly, and the wound nearly closed. Dis-

continued medicine and allowed full diet. The granulations being exuberant, directed them to be touched with nitrate of silver daily until that condition disappeared.

*August 1.* The wound being healed and the patient in good health, he was transferred to the Lincoln Military General Hospital, for exchange as a prisoner of war.

*Comments.*—Gunshot wounds of the scalp are less likely to heal by first intention than almost any other lesions of the cranial integuments having a contused and lacerated nature. They generally suppurate and heal by granulation. Their cure is therefore comparatively slow and protracted. This peculiarity of gunshot wounds in general was noticed in former times, and was then ascribed to some mysterious agency. It was believed that the wounds inflicted by so “devilish an engine” as a gun were in reality poisoned wounds, that the missiles producing them acquired an envenomed nature and a cautery-like action from the explosive force, or from some mysterious property of gunpowder. At the present day, however, the surgeon is not disturbed by such dreadful fancies. He says in the language of John Bell, “there is a peculiarity, but no mystery in gunshot wounds.” He recognizes the circumstances upon which the peculiar features of gunshot wounds depend. Some of these circumstances are illustrated by the case just related. The violence of the contusing force with which the projectile moved was so great as to completely destroy the vitality of the tissues that immediately surrounded the track made by the projectile in the substance of the scalp. In this way a thin lamina of the wounded tissues was killed outright. Afterwards the thin layer of dead tissue was detached from the living by an ulcerative process, and cast off like a slough. Hence the ash-coloured appearance which the wound at one time presented. Generally, the bruised tissues, in cases of gunshot wounds of the scalp, slough off to a moderate extent, and leave a healthy granulating surface. The substance lost in this way usually consists only of a thin lamina surrounding the track of the projectile, and, owing to the superior vitality of the scalp, is generally much less extensive than that which attends gunshot wounds of the integuments on most other parts of the body, of similar severity. The place of the tissues thus lost is, to a certain extent, supplied anew by the granulating process, the wound gradually contracts, and, after a time cicatrizes, when the cure becomes complete. Thus, we have shown to us the reason why, as a general rule, gunshot wounds of the scalp do not unite by primary adhesion, and likewise the reason why their cure is apt to be protracted. To this rule, however, exceptions sometimes occur, for wounds of the cranial integuments inflicted by rifle balls, and other gunshot projectiles, do occasionally heal by the first intention; and, in general, the more closely such a wound resembles a purely lacerated or a simple incised wound, especially the latter, the more likely is it to unite by primary adhesion. Examples in point are not unfrequently afforded by the traumatic lesions of the integuments at large

which are inflicted by more or less sharp fragments of exploding shells. The more largely contusion prevails as an element of the wound the more certain is it to suppurate and heal by granulation. Still, I have no doubt that, in exceptional instances, wounds of the scalp occasioned by leaden bullets heal by the first intention.

But, gunshot wounds of the scalp, restricting the use of the term to those that are properly so called, are attended with a very considerable mortality. This fact is well shown by the statistics and the histories of many cases of this form of injury that were collected during our war of the rebellion. On this point Dr. Otis, the accomplished author and compiler of the surgical history of the war, remarks: "The 7739 cases are accounted for as follows: 162 patients died, 1186 were discharged, and 6391 recovered. But as 1186 patients discharged include many who were mustered out on the expiration of their term of service, or who failed to return from furlough, or who deserted, a nearer approximation to exact truth is attained by the statement that 162 died, 522 were discharged on certificates of physical disability, and 7055 probably recovered. The death-rate of gunshot wounds of the integuments of the cranium during the late war was, therefore, about 2.09, or nearly one fatal case in 48." (*Op. cit.*, part first, vol. ii. p. 89.)

Dr. Otis also gives brief abstracts of the 162 fatal cases, as well as of 38 that recovered. With regard to the fatal ones, he says: 54 are reported as uncomplicated. In every instance, the most careful scrutiny has been exercised to determine if any injury of the cranium, or its contents, was suspected by the surgical attendants." (p. 71.) Nine others died while on furlough, "and it has been impossible to ascertain particulars of the complications which led to the fatal results." (p. 74.) Thus we find that "the records are silent regarding the causes of death in sixty-three examples of gunshot wounds of the scalp here enumerated. The average interval between the reception of the injury and the fatal termination was twenty-seven days. It may be suspected that in most, if not all, of these cases, there was some undiscovered primary or secondary lesion of the skull or its contents, but precise evidence on the subject is wanting. The seat of the injury is specified in twenty-seven cases; as in the frontal region in seven, the temporal in two, the parietal in twelve, the occipital in six." (p. 75.) With regard to twenty-two cases which terminated fatally from inflammation of the brain or its membranes, he remarks: "The reports indicate that the injuries were carefully examined, and that the observers were convinced that there were no primary lesions of the skull." (p. 75.) Concerning eight other cases, he says: "It may be inferred from the nature of the prescriptions, that some form of encephalitis supervened and induced the fatal results; but the precise nature of the secondary complications were not reported." (p. 77.) Eight cases were also reported "which terminated fatally in consequence of the meningeal

inflammation following the invasion of erysipelas." (p. 79.) Four died from traumatic gangrene. (p. 80.) Two cases, "complicated with hemorrhage, had a fatal termination." (p. 82.) In five cases tetanus was the cause of death. "In every instance the invasion of this complication was ascribed to exposure to dampness, with sudden depression of the temperature of the atmosphere." (p. 83.) Five died from pyæmia. (p. 84.) In twelve cases "the fatal results are ascribed to typhoid fever." (p. 85.) In four cases "the fatal terminations were attributed to incidental malarial attacks. But as the symptoms were not minutely described, and the necroscopic appearances were not observed, suspicion arises that, in some of the cases at least, the chills may have been symptomatic of internal supuration, or a part of the characteristic phenomena of pyæmia." (p. 86.) "In thirteen cases of gunshot wounds of the scalp, pneumonia is reported as the cause of death; but, in several of them, it is questionable if the pulmonary complications were not embolic phenomena, indicating the formation of metastatic foci, and whether these cases would not have been more properly classified under the head of pyæmia." (p. 86.) Three fatal cases were complicated by the supervention of variola. (p. 87.) In one case hepatitis, in four cases diarrhœa, in one case privation in prison, in one case diphtheritis, and in one case delirium tremens were reported to be the causes of death. (pp. 87, 88.)

Upon the foregoing summary statements Dr. Otis makes the following interesting and instructive comments:—

"In discussing the ratio of fatality of gunshot wounds of the scalp, deaths from intercurrent diseases have been included in the estimates, in conformity with the system of reports in the United States army. In one hundred and twenty-two of the one hundred and sixty-two fatal cases, death would appear, beyond question, to have resulted, either directly or indirectly, from the effects of the wound; some form of encephalitis being the proximate cause in ninety-eight cases, and such complications as erysipelas, gangrene, hemorrhage, tetanus, and pyæmia, in twenty-four cases. The remaining forty cases include twenty-nine deaths, attributed to typhoid and malarial fevers, and pneumonia, in regard to which it is difficult to determine how far the febrile or pulmonary symptoms were sympathetic only, and eleven deaths, due to variola, diphtheritis, hepatitis, privation, and delirium tremens, the original injury having little if any connection with the fatal event. The duration of life after the reception of the injury, of the one hundred and sixty-two fatal cases, taking an average from them all, was forty days. The mean interval in the cases in which the fatal terminations were due to encephalitis, was twenty-four days. Some of the patients who succumbed to secondary diseases less directly dependent on the injuries received, survived many months." (*Medical and Surgical History of the War of the Rebellion*, part first, vol. ii. p. 94.)

Gunshot wounds of the scalp, using the term in a properly restricted sense, are attended and followed by more disastrous consequences than most other solutions of continuity of the cranial integuments of similar extent and not complicated with appreciable lesions of the underlying parts. For this exceptionally bad character which gunshot wounds of the scalp possess there is a threefold reason: 1. Gunshot wounds of the cranial integuments are, in general, attended with a much higher grade of inflam-

matory reaction than incised or lacerated or contused wounds of the same part. 2. The inflammatory process is not only more severe, but it is also much more liable to spread from gunshot wounds of the scalp to the underlying parts, such as the diploë, the membranes of the brain, and the brain itself, than it is to spread from other wounds of the same parts. 3. Gunshot wounds of the scalp are much more apt to be attended with injury of the histological elements or morphological constituents of the underlying parts without breaches in the structure which are cognizable by our unaided senses, than the other forms of injury to which the cranial integuments are exposed. This circumstance affords the reason why gunshot contusions of the scalp, while seemingly quite trivial, are really injuries of very serious import.

We are not surprised to find that scalp wounds inflicted by gunshot projectiles are more frequently accompanied by unrecognized injury of the parts beneath, than like wounds of the same tissues produced in other ways, when we attentively consider the peculiarities of the method by which the mechanical force that does the injury is usually applied in such cases, in other words, when we attentively consider the elements of the destructive power of bullets. Our present purpose requires us to mention but two or three of these peculiarities. They are, firstly, the very great velocity with which gunshot projectiles are usually moving at the time of inflicting the injury, when compared with that which pertains to the motion of other bodies causing analogous injuries. A bullet, whose force is mostly spent, is still moving very much faster than a horse's foot in kicking, or a brick in falling from a scaffold, or a tile in falling from the roof of a house. A bullet, whose force is mostly spent, is still moving very much faster than a human head ever does in falling to the earth. The difference in comparative velocity is, of course, very much greater, we might, with propriety, say almost inconceivably greater, when the bullet is in full flight; and most of the simple injuries of the scalp of a contused, or lacerated and contused character, that are not produced by gunshot projectiles, are produced either by falling bodies or by blows from the human hand or some weapon held in it, or by the kicks of animals, or by the falling of the head itself against the earth or some other firm body.

The second of these peculiarities is the comparatively small objective surface which a bullet presents when contrasted with the corresponding surface of most of the other bodies mentioned above. Now, the remarkably destructive power of bullets results mainly from the rapidity of their motion, the smallness of their objective surface, and the largeness of their weight. It is upon these three elements that the peculiarities of gunshot wounds, as a class, mainly depend. Thus, experience has shown that the destructive power of gunshot projectiles increases in a notable manner as their velocity increases, when their objective surface and weight remain the same; also, that this destructive power is increased by augmenting the



weight of the projectile while its velocity and objective surface remain the same; and, again, that the destructive power is increased if the objective surface is diminished in extent while the velocity and weight are the same.

Practically, in studying the injuries of the head which are caused by a given projectile, such as a cylindro-conoidal ball of given dimensions, for example, a Springfield musket-ball, the velocity of its motion and the angle of impingement together with the structure of the part of the head that is struck, are the subjects of most interest to the surgeon, since the weight and the objective surface always remain the same. If such a projectile strikes the head fairly when in full flight, it carries everything before it, going completely through the head, and makes a perforation having a diameter about equal to that of its objective surface. If it strikes the skull at a very acute angle when in full flight, it may be reflected therefrom, or glance off as it is commonly termed, and produce a scalp wound without breaking the bone. In such cases, however, the pericranium is usually either torn or badly bruised, and the bone itself either bruised or indented somewhat, or grazed by the bullet. If such a projectile strikes the head fairly while moving at a considerably diminished rate its force is, not unfrequently, insufficient to penetrate beyond the integuments. It goes also through the scalp, hits the skull, becomes more or less flattened thereon, and there it either stops or lodges, or it bounds back from the skull, and escapes through the perforation in the scalp by which it entered. On examination, such an injury often appears to be only a simple flesh wound. But in such a case the destructive effects of the bullet are not, in reality, limited to the scalp. Its progress has been stopped by the skull and the underlying parts. Its force has not been sufficient to overcome the resistance which they offer, and to make a way for itself through them. It has struck a barrier through which it is not strong enough to pass. But it expends its force, whatever the amount may be, against the portion of the barrier that is struck, and principally on an area corresponding in diameter to that of its own objective surface. The projectile imparts its own motion, when its further progress is arrested, to the particles of matter lying beyond it, in the direction of its line of flight. Thus, a limited portion of the underlying structures, which are all more or less elastic, for example, the skull, the membranes of the brain, and the substance of the brain itself, are liable to be thrown into violent vibrations.

That such a result can be produced in this way is proved by every musket ball that rebounds from a cranium, for this new motion of the projectile is, for the most part, produced not by the elasticity of the lead of which the ball is composed, but by the resiliency of the cranium and the structures beneath it. Now, the several planes of tissues which enter into the composition of the skull, the membranes of the brain, and the brain itself, differ much in respect to density, toughness, elasticity, and strength. For example, the external table of the skull is tougher and more elastic than

the internal table. The diploë is sponge-like in structure, and its cells are filled with soft medullary tissue. The dura mater is thick, fibrous, and strong; the arachnoid thin, diaphanous, and weak. The pia mater consists of loose connective tissue, having many thin-walled bloodvessels ramifying in it. The substance of the brain is comparatively soft and delicate in structure. So when these several planes are thrown into vibrations by the stroke of a gunshot projectile whose further progress has been arrested by them, their vibrations are not rhythmical, but jarring and discordant, and the stronger the vibrations are the greater the discordance or clashing becomes. Thus, if the vibrations produced by the impact of the projectile are very strong or violent, the spongy structure of the diploë may be broken thereby, or the internal table of the skull may be fractured, or the membranes of the brain may be lacerated, or the substance of the brain itself may be bruised and even torn, or the longitudinal sinus may be ruptured, as happened in a case related in the surgical history of the British army in the Crimean war (*op. cit.* vol. ii. p. 287), or some bloodvessels of the pia mater may be ruptured and blood extravasated beneath the visceral arachnoid membrane into the sulci of the brain, as happened in the person of Col. Farnham during our own war of the rebellion (*op. cit.* p. 110), and in many other cases that I have seen, some of which will hereafter be related, and all this internal mischief, together with a great deal more of similar sort, may be produced without corresponding fracture or even apparent injury of the external table of the skull.

The gunshot wounds of the scalp observed during our war of the rebellion presented many varieties. There were mere scratches of the skin produced by shell fragments, solutions of continuity resembling incised wounds, bruises analogous to ordinary contusions with abrasions of the cuticle, furrows or more or less cleanly cut grooves made by bullets moving with great velocity, lacerations with flaps or with much loss of tissue, long fistulous tracks or tunnel-like canals, and wounds with lodgment of the missile (*Otis*).

*Treatment of Gunshot Wounds of the Scalp.*—The hemorrhage from such wounds is generally but moderate, and in a short time ceases spontaneously. If it does not the application of a compress wet with cold water, and a moderate amount of pressure by means of a suitable bandage may be advisable. If, however, the bleeding is profuse, and if a vessel of some size is wounded it is generally best to secure it without delay by ligatures applied one on each side of the bleeding aperture in its walls. The hair should be removed from the scalp in the vicinity of the wound to a considerable distance on every side of it. Foreign bodies should be carefully searched for and extracted. The foreign substances most frequently found in gunshot wounds of the scalp are the projectile itself or portions of it, hairs, fragments of the wounded man's hat or foraging cap, buttons, bits of metal torn from the soldier's uniform or equipments, and patches or wads

if smooth-bore rifles or bird-guns are the weapons. Sometimes particles of powder are found sticking in the wound, and, in rare instances, a tooth, a fragment of bone, or bit of clothing from a wounded comrade previously struck by the same bullet, which had been carried forward in its flight.

All foreign bodies having been removed, the bleeding stanchcd, and the wound thoroughly cleansed with warm water, the dressings should generally be light, and such as favour the separation of the eschar, and soothe the wound, *e. g.*, the water, or some other emollient application. Inasmuch as we do not expect to obtain union by primary adhesion, it is in general not necessary to coapt the edges of these wounds nor to secure them in any way by sutures, or plasters, or bandages. In exceptional cases, however, for example, when a portion of the scalp is stripped off by a fragment of shell and still hangs by its edge, it is advisable to restore it as nearly as possible to its natural position, and retain it there by suture, and plaster, and bandage. Cuts of the scalp made by sharp splinters of exploding shells may sometimes be advantageously treated on the same plan. But in a large majority of the cases of gunshot wounds of the scalp the objects of the local dressings should be to soothe the inflammatory excitement, to promote the separation of the eschar, and, after it has been cast off, to favour the granulating process. All accumulation of pus in the wound should be prevented, and to that end counter-openings should be made whenever necessary. Seton wounds and fistulous canals should be cleaned at least once a day by syringing. If the inflammation is but slight, which fortunately obtains in most instances, some antiseptic and moderately stimulating lotion applied to the wound on a compress that is frequently changed, such, for example, as rectified spirit and water (part 1 to 4), or liquor sodæ chlorinat. (part 1 to 20), or a weak solution of carbolic acid (part 1 to 100), are generally found useful. If, however, the slough be extensive and the odour very rank, a stronger solution of carbolic acid (part 1 to 10), or of liquor sodæ chlorinat. (part 1 to 4), may be advantageously applied. After the process of cicatrization has commenced, and the wound has begun to contract, if the granulations are large, pale, and flabby, or weak, it is generally advisable to apply some dry dressing such as lint alone, or lint smeared with Peruvian balsam, or with resin cerate, and administer tonics internally, especially certain preparations of iron. The sesquichloride of iron in the form of pill or tincture is one of the best chalybeates on account of the ease with which it is assimilated. When it is advisable to administer a bitter tonic along with a chalybeate the citrate of iron and quinia is a convenient form for exhibition. If the granulations become exuberant they should be cut down with lunar caustic, or snipped off with scissors.

But, when the wound happens to be considerably inflamed, it becomes a matter of great moment to allay the inflammatory process in the scalp on the one hand, and to prevent its spread to the underlying parts on the

other. For the statistics of our war of the rebellion, quoted above, clearly show that, in a very large proportion of the cases where death occurred, the fatal termination was due to extension of the inflammatory process from the wound to the underlying parts, such as the cranium, the diploë, the meninges, and the substance of the brain. Generally, while we keep the inflammatory process at the wound and its vicinity within bounds, the patient having gunshot wound of the scalp, properly so called, may be considered to be in a safe condition. Now, the most efficient of all the means we possess for the abatement of inflammation in scalp wounds, and for the prevention of its spread to the neighbouring parts is the application of the ice-bag, or, in its absence, of iced compresses or iced poultices to the inflamed wound itself. I have employed cold in this way in a great many cases where the cranial integuments were wounded and inflamed, and always with most satisfactory results. Indeed, my success with this practice during the war of the rebellion has attracted the favourable mention of a most competent judge. Dr. Otis says: "In a number of cases where cerebral symptoms impended, besides resorting to general treatment, ice-bladders were applied to the head. This method was adopted with advantage in numerous cases at the Stanton Hospital, at Washington, under the direction of Surgeon John A. Lidell, U. S. V." (*Op. cit.*, p. 95.) I do not mention this in a boastful spirit, but for the purpose of impressing upon the reader's memory the great value of this practice. An inflamed scalp-wound should, therefore, have cold applied to it in this way, not by fits and starts, but continuously during both night and day, until the object for which it was prescribed has been attained. Rest in bed with a spare diet should also be enjoined, and saline laxative with cooling drinks should be administered. If febrile movement of a decided character, together with headache and other symptoms of cerebral irritation are present, absolute quietude with a low diet should be insisted on, and saline purgatives should be given every six or eight hours together with aconite in full doses but at shorter intervals, according to the urgency of the case.

Again, there is considerable risk that gunshot wounds of the scalp may become complicated with pyæmia, embolic phenomena in the lungs, etc. The means which should be employed to avoid such a result are, *first*, the maintaining of a cleanly condition of the wound, and the use of the antiseptic dressings thereof already mentioned; and, *secondly*, the preventing of the spread of inflammation from the wound to the medullary tissue of the diploë, or the occurrence of cranial osteo-myelitis, by using the means just indicated. In such cases, when pyæmia or embolism supervene, they have, for the most part, their starting-point in softening thrombi within the veins of the diploë, and coagula or thrombi do not form in these veins unless the medullary tissue that surrounds them is inflamed. If, then, we can ward off the cranial osteo-myelitis, we can also ward off the cranial thrombosis together with pyæmia and the other accidents that may

spring therefrom. When, however, the initial symptoms present themselves they should be combated with quinia administered in doses of ten grains three or four times a day, together with a free use of nutrients and alcoholic stimulants. In all cases of scalp wounds where there appears to be any liability to the occurrence of consecutive inflammation of the diploë (osteo-myelitis), or of the membranes of the brain (meningitis), or of the substance of the brain (cerebritis), a close watch should be kept for the appearance of the earliest symptoms which announce that either of these pathological conditions is impending, and, to that end, the surveillance of the patient should not cease until a period of at least three or four weeks have elapsed after the injury.

Secondary hemorrhage from gunshot wounds of the scalp not unfrequently appears, and whenever it does occur, it generally proves a very troublesome complication. If the bleeding is but slight it may be controlled by pressure and styptics. If, however, the hemorrhage is considerable, an effort should always be made to tie the bleeding vessel in the wound, and this proceeding will generally prove successful if carried out with reasonable care and skill. But, if the attempt at deligation fails, acupressure should be tried before resorting to ligation of the main arterial trunk.

Erysipelas often presents itself as a complication of gunshot wounds of the cranial integuments. Generally, the form in which it appears in such cases is a mild one, and then it gives but little trouble. In exceptional instances, however, it proves to be very severe, and requires that all the resources of surgical art should be brought to bear in order to successfully combat it. In these cases of phlegmonous erysipelas, most prominent among the local measures which should be employed are free incisions in the tumefied and boggy scalp for the purpose of liberating sloughs and facilitating the discharge of sanious or purulent matter. Among the constitutional measures the administration of the tincture of the chloride of iron and the muriate of quinia in full doses, together with alcoholic stimulants in liberal quantity, are matters of the most importance. There is scarcely another disease in which alcoholic stimulants, according to my experience, do so much good as in phlegmonous erysipelas of the head.

Gangrene of a spreading character occasionally attacks the contused and lacerated wounds of the scalp which are produced by gunshot projectiles. This complication should be treated locally by the application of nitric acid, and constitutionally by the administration of the tincture of the chloride of iron in doses of twenty drops with two grains of the muriate of quinia every four hours, of nutrients and alcoholics, together with enough of opium or morphia to assuage the pain, which is usually a troublesome symptom in the cases belonging to this category.

4. *Incised Wounds of the Scalp.*—Wounds of the cranial integuments produced by cutting instruments are generally much simpler in their nature

than the breaches in the same structures which are produced by other means. They consist essentially of a comparatively clean division of the flesh, and, therefore, present a comparatively clean appearance. They are generally not complicated with disintegration of tissue from contusion, nor with raggedness of their edges from laceration, nor with ecchymosis from interstitial hemorrhage. Their lips have not been killed by the force of the blow which made the wound, as happens not unfrequently in cases of gunshot and other severely contused wounds. They contain no dead tissues to be slowly separated and cast off from the living tissues by the process of ulceration and suppuration, and then replaced by the process of granulation. With proper treatment they are not likely to suppurate at all, but unite speedily by primary adhesion.

They are not only less likely to become immediately inflamed and to suppurate, but also are much less liable to be accompanied by an undetected injury of the skull or its contents, than most other wounds of the scalp. This circumstance results from two causes: *first*, the comparatively small amount of force that is required to divide the cranial integuments with cutting instruments; and, *secondly*, the superior facilities which the clean edges and the open state of such wounds afford for determining their real extent and depth, together with their complications. They, therefore, as a rule, prove much less troublesome to manage than most other wounds of the scalp.

In civil life incised wounds of the cranial integuments occur, for the most part, in brawls or affrays, and are inflicted with knives or daggers, of various sizes and shapes, with intent of doing bodily harm. Occasionally, however, they are inflicted with the sharp-edged tools of industry, for example, scythes, chisels, axes, cleavers, etc., by accident or by design. I have treated one case where the scalp was accidentally cut into by the rebound of an axe, while its helve was in the patient's own hands, however strange such an occurrence may seem.

In military life, incised wounds of the scalp usually present themselves in the form of sabre-cuts and sword-thrusts; and still it is quite remarkable how seldom they occur in comparison to other wounds, even in time of war. The medical and surgical history of our war of the rebellion gives but two hundred and eighty-two instances of incised scalp-wounds, of which forty-eight were Confederates, mostly prisoners of war, while it contains seven thousand, seven hundred and thirty-nine cases of gunshot wounds, properly so-called, of the cranial integuments. (*Op. cit.*, first part, vol. ii. p. 1 *et seq.*) During a period of about two years wherein I was the surgeon in charge of Stanton Military General Hospital at Washington, only four cases of incised scalp-wounds were treated there. Three of them were captured Confederates held as prisoners of war, and the other one was a Union soldier whose case will presently be related. They all had sabre-cuts of the scalp, and all got well. Each of their cases

is briefly given by Dr. Otis in the above-mentioned history of the late war. During a period of about two years altogether wherein I served with the Army of the Potomac in the field, at different times and places, among several thousand wounded examined by myself with much care, I saw but very few cases of incised scalp-wounds, so few that my field note-book makes scarcely any mention of them. It does, however, mention in some detail a rather interesting case of face-wound that came under my notice at Burk's Railroad Junction, in Southern Virginia, a point where about 2000 soldiers wounded in action during the last five or six days of the war, *i. e.*, between April 3d and April 9th, 1865, were received and cared for under my direction, until they could be sent forward to the Depot Field Hospital of the Army of the Potomac at City Point, Va. The following is a transcript of the memorandum: April 10, 1865, I saw and examined a cavalry soldier, belonging to Gen. Sheridan's command, who had been wounded in the face by sabre-cuts on April 3d, *i. e.*, seven days ago, whereby he had received a long gash in each cheek. These wounds were already healed, union having taken place by primary adhesion. They had been closed with interrupted sutures, and had given the patient but little trouble, as they had not been swelled nor inflamed.

In the few instances of sabre-cuts of the head, which have passed under my observation, the cranium and encephalon proved to be uninjured, the wounds themselves limited to the integuments, and it is believed that all of them resulted in a recovery that remained permanent. The following case was one of them, and as it serves to illustrate the nature, progress, and usual termination of this form of injury, together with the principles upon which its treatment should be conducted, it is here presented to the reader:—

CASE IV. Private Joseph Yeagle, Co. L, 5th New York Cavalry, aged 32, was admitted to the Stanton U. S. Army General Hospital, at Washington, June 25, 1863, having a sabre-cut on his head of considerable size, which he informed us was received in a hand to hand fight with the enemy's cavalry, at Middleburg, Va., four days previously, *i. e.*, on June 21st. On removing the dressing, which was the original one, it was found that the wound was a sabre-cut of the scalp only, and that it was doing well. The hair had been shaved off over a large space round the wound, its edges had been nicely coaptated, and then securely held in position by narrow strips of adhesive plaster, with a compress and retaining bandage placed over all. No sutures were employed. Pretty firm union had already taken place when he entered the hospital. It had occurred by adhesion, and without the formation of any purulent matter whatever. He complained of his head feeling full, and had a rather stupid look; but his pulse was natural, tongue clean, appetite good, bowels regular, the scalp itself was but slightly swelled, and but little sore at the place of injury, and the cranium had not sustained appreciable lesion. Placed a few strips of plaster across the wound to support the cicatrix for a few days longer, and prescribed magnesia sulph.  $\mathfrak{z}\text{j}$  with a low diet. He made no further complaint, and his wound gave no further trouble.

*June 29th.* He was returned to duty cured, and there is good reason to believe that the cure was permanent.

*Comments.*—The principal danger to be apprehended in cases, such as the foregoing, is that the skull, or the encephalon, has sustained some undetected injury. The possibility that the cranium or the brain may receive some obscure injury from the weapon itself which can pass unrecognized for a considerable time is quite obvious. It is this circumstance that gives them most of their importance. The following observation made in the Crimean war illustrates this point: "John Dryden, 11th Hussars, received 31 wounds on 25th October, and was taken prisoner and treated in the Russian hospital at Simpheropol. In December, 1855, his wounds were healed up, and he was sent to Scutari, where he began to suffer from vertigo. He arrived in England on 6th April, 1856, and was discharged the service 22d May, still complaining of giddiness." (*Op. cit.*, vol. ii. p. 366.) The experience of our own army medical department vividly illustrates the same point. Of the 282 cases of sabre-cuts and sword-thrusts of the scalp mentioned above as having been reported during the war of the rebellion, 3 died from some form of encephalitis, 3 also died from complications, and 11 were more or less completely disabled, some from mental aberration, others from vertigo, impaired sight, headache, pains in the injured part, ptosis, and amaurosis. (*Op. cit.*, part first, vol. ii. p. 15.) Therefore, in all cases of incised wounds of the scalp, but especially those which are produced by sabres, axes, hatchets, and cleavers, the injured part should be closely examined, and the functions of the brain should be carefully interrogated by the surgeon, to the end that no lesion which ought to be discovered should, by any neglect, be overlooked.

The indications for the treatment of incised wounds of the cranial integuments are, in general, as follows: *First.* Arrest the hemorrhage which not unfrequently is profuse, by closing the mouths of the bleeding vessels with ligatures. Usually, the distal orifices must be tied as well as the proximal, because of the free inosculation which exists among the terminal branches of the arteries of the scalp. Styptics, such as liquor ferri persulph., etc., should not be used to stop such bleeding, because they would often fail, would always make the dressing of the wound more difficult, and retard the cure. *Second.* The hemorrhage being arrested the wound itself should be thoroughly explored with the finger, if possible, in order to determine whether the skull also is injured, and whether the wound contains any foreign body which should at once be extracted. *Third.* The hairy scalp should be denuded by shaving to a considerable distance from the wound on every side. The wound itself should be gently cleansed with tepid water, all blood-clots and hairs carefully removed, the neighbouring parts also washed clean, and then they should all be thoroughly dried with a soft napkin. *Fourth.* The oozing of blood from the cut surface having wholly ceased, the lips of the wound should be approximated,



accurately coaptated, and maintained in that relation with strips of isinglass or adhesive plaster supported externally, if necessary, by a retentive bandage. The dressings should always be light. In most cases the employment of sutures is not advisable, because it is unnecessary, and might do harm.

Such patients make good recoveries under the simple treatment just described. In a considerable number of cases, however, the interrupted suture can be employed with positive advantage, and in a few cases it is indispensable. Whenever the hair-clad edges of the wound incurve a good deal, which not unfrequently happens, much better results are obtained by holding the lips of the wound together with sutures put in at a sufficient number of points, for by so doing the incurvation and its untoward results are entirely avoided. When the lesion of the scalp consists of a long flap-shaped cut the use of sutures is also very advantageous. *Incised wounds of the scalp, especially when they are long and penetrate through it to the skull, are apt to gape widely on some parts of the head, from the elasticity of the injured structures and the looseness of the underlying connective tissue.* In some cases of this sort the employment of interrupted sutures is indispensable. I have seen more than one example. At an early period in the after-treatment, *i. e.*, on the second or third day, or as soon as the lips of the wound are securely glued together, the sutures and ligatures should all be taken out, because their presence tends to prevent the occurrence of union by the first intention. In healthy subjects, incised wounds of the cranial integuments, when treated on the plan above stated, almost always heal up at once. But in unhealthy subjects, or in those whose constitutions are broken down by intemperance, by want and exposure, by scurvy, or by the syphilitic *cachexy*, such wounds may suppurate and heal by granulation. Such cases always require a supporting kind of treatment with the exhibition of tonics and other remedies specially adapted to correct the constitutional vice upon which the local difficulty depends.

The following case will serve to show how very important it is in many instances for the surgeon to carefully explore even the incised forms of scalp-wounds for the purpose of finding foreign bodies that may be impacted therein, and extracting them:—

CASE V.—Patrick Develin, aged 40, by occupation a brewer, while attempting to walk in Eleventh Avenue, near Thirty-seventh Street, about 7 o'clock P. M., July 22, 1867, being considerably under the influence of drink at the time, tripped on the curbstone, and, staggering to about the middle of the street, fell heavily on his face across the track of the Hudson River Railroad, sustaining thereby a "severe cut," as his injury was called, *i. e.*, an incised wound, of the forehead. He went to a drug-store in the neighbourhood, and there had his wound dressed. Two stitches were employed in sewing it up. On the eighth day afterwards, July 30, he was seized with lockjaw, and taken to Bellevue Hospital, where he died at 6½ o'clock P. M., August 1, of that disease.

The coroner was called to the case, and Dr. Wooster Beach, his deputy, made an *autopsy*. He found that "there was a deep incised wound on the forehead, and at the bottom of this cut was a *small piece of wood*; the death resulted from this wound, but lockjaw or tetanus was the direct cause."

There is scarcely room for doubt that if the foreign body, the small piece of wood, had been removed from this man's scalp at the time his wound was sewed up at the drug-store, he would have got well. The lesson this case teaches is so plain that further comment is unnecessary.

One word more, however, concerning the employment of sutures to close up cuts of the scalp. I am satisfied from personal experience that they are much less hurtful than many suppose, provided they are not left in too long. For I have a good many times used the interrupted suture in dressing long cuts of the scalp that had been made by myself and others in performing surgical operations on these parts, and never saw any bad effect whatever resulting therefrom. The stitches, however, were always taken out at an early period, usually on the second or third day, rarely as late as the fifth day. The following example is in excellent point:—

CASE VI.—On November 9, 1874, I extirpated an ulcerating epithelioma for a delicate-looking lady of middle age, which was situated on the upper part of her forehead, near the hair-line, with the knife, by making two long curved incisions, one on each side of it, through the scalp down to the skull, laying bare the pericranium. This was done with a view to make sure of the removal of all the roots of the disease. The wound of operation was about three inches long, and gaped open to the extent of fully two inches, a space considerably wider than the piece removed. Having stanchd the hemorrhage with ligatures, etc., I drew the lips of the wound well together with strong silken threads, passed deeply into the scalp at three points, one being in the centre and the other two midway between it and each angle of the wound, and securely tied them. The tension was very great, so great indeed that these three sutures would have inevitably been torn out, unless they had been planted very deeply. The coaptation was completed by applying long narrow strips of isinglass plaster across the wound on the spaces between the stitches, leaving the latter exposed to view. A thin, dry compress and a retentive bandage completed the dressing.

Visited the patient and looked at the wound every day. The cure progressed favourably in every respect. But little swelling and no redness appeared. Left the stitches undisturbed until the 14th, *i. e.*, five days after the operation, as they gave no trouble, and I feared the wound might reopen if they were withdrawn too soon. Then I cut them in two, and picked them out, leaving the plasters *in situ*. On the 20th, *i. e.*, eleven days after the operation, removed the plasters also, and found that the wound had completely healed, without suppuration, and with but a trifling scar.

Four years after the operation I heard from this lady, and learned that there had been no return of her disease.

5. *Punctured Wounds of the Scalp*.—This form of injury occurs much less frequently than most of the other traumatic lesions to which the in-

teguments of the head are exposed. The medical and surgical history of our war of the rebellion contains but eighteen cases of punctured scalp-wounds. "Nine were inflicted by sentinels, or received in broils or attempts to desert. Nine were received in action." (*Op. cit.*, part first, vol. ii. p. 30.) An examination of the record shows that all of them but one were produced by bayonets, and in that case, although the weapon is not stated, it was in all probability also a bayonet. Thus it is shown that in modern military life punctured wounds of the scalp are not only of very infrequent occurrence, but they are for the most part produced in one sole way, viz., by bayonet stabs. In civil life, however, punctured wounds of the cranial integuments are met with much oftener, and are produced in many different ways. They occur in accidents from falling down upon, or from running against, or from being struck by pointed objects of many different kinds, *e. g.*, fork-prongs, projecting nails, wooden splinters, broken glass, etc. They occur in affrays, from stabbing the head with ice-picks, pocket knives, scissors or shears, daggers, sword-canes, etc. In great maritime ports like New York, they often occur in broils among sailors, long-shoremen, and their associates, from stabbing the head with sheath-knives.

Punctured wounds of the head are frequently attended with punctured fracture of the cranium. The blow which sends some sharp-pointed body into the scalp, drives it also into the skull. For example, there occurred during the war of the rebellion, twenty-four cases wherein punctured wounds of the head were sustained. In six, *i. e.*, in one-fourth of them, there was also punctured fracture of the skull (*loc. cit.*, pp. 30, 33), whereof five proved fatal. In civil practice, likewise, punctured wounds of the head are found to involve the cranium as well as the scalp in a large proportion of instances. I can now recall to mind several cases of this sort. The first duty, then, of the civil as well as the military surgeon who has to treat what appears to be only scalp-wounds of a punctured character, is to determine on the spot whether the cranium also is injured; or, in other words, whether in reality he has to deal with punctured fracture of the skull. Next, he should carefully explore the track of the wound in order to discover any foreign body which may be hidden therein, and promptly to extract the same. Some forms of punctured scalp-wounds are exceedingly apt to retain parts of the object which has produced them—for example, splinters of wood and fragments of glass that have been broken off and left impacted behind. Such cases should always be examined with very great care by the surgeon, lest through negligence he may allow that to remain in the wound which must inevitably occasion much trouble, and may even give rise to tetanus of a fatal character.

Punctured wounds of the scalp are more liable to be attended with the penetration of some artery of importance than punctured wounds of the integuments on any other part of the body, because the arteries of the scalp, surrounded as they are by the compact structures of the cranial in-

teguments, cannot glide away from the point of the instrument in a loose connective tissue, as the arteries may do in other portions of the organism, escaping penetration thereby. Punctured wounds of the scalp are, therefore, very liable to be attended by a hemorrhage which is entirely out of proportion to the apparent magnitude of the wound. This idea is well illustrated by what occurred in a case already mentioned—a remarkable case—wherein fatal hemorrhage from the left temporal artery took place upon its being penetrated in a wound received by falling against the small key of a book-case, *i. e.*, in a punctured wound of a contused and lacerated character. In this case the conditions of the hemorrhage were such that Nature unaided could not stop it even for the time being, and no assistance coming, the man died from loss of blood. When an important artery of the scalp has been simply opened or incompletely divided, as it is in the class of cases we are now considering, the hemorrhage is almost certain to continue until death is produced on the one hand, or it is arrested by the surgeon's art on the other; for the coats of the wounded artery cannot contract around the bleeding orifice, nor retract themselves into the arterial sheath to such extent as to secure the lodgment of a plug of coagulum that shall stop the hemorrhage. In all the cases belonging to this category the surgeon's duty is exceedingly plain. He should proceed at once to tie the wounded vessel on both sides of the aperture in its walls, using of course two ligatures for that purpose.

Punctured wounds of the cranial integuments, especially when they extend obliquely to a considerable distance underneath, not unfrequently suppurate, and sometimes give rise to alarming symptoms in consequence thereof. They may excite a suppurative inflammation in the loose connective tissue beneath the aponeurosis of the occipito frontalis muscle, and then, the matter wanting vent, burrows in that tissue, sometimes causing the aponeurosis itself to slough, or destroying the pericranium also, it denudes the skull to a great extent, and the inflammatory process, spreading through the cranium to the encephalon, produces encephalitis with all its dire results. These destructive consequences of punctured wounds of the scalp may, however, in great measure be avoided by letting the purulent matter out as soon as formed; and for this reason, the surgeon when treating injuries belonging to this category should always secure a free outlet for the pus at an early period, by promptly making free incisions through the scalp over the suppurating foci, and by repeating them as often as may become necessary from the spread of the morbid process.

Furthermore, it sometimes happens in cases of punctured and other wounds of the scalp, especially when the subject is unhealthy or his constitution is broken down by intemperance, scurvy, or constitutional syphilis, that the surrounding parts are affected with a destructive inflammation of a peculiar character, and become tumid, boggy, soft, infiltrated with thin, purulent matter, and sloughy, whereby an artery that has been injured is

opened by the ulcerative process, and dangerous hemorrhage results therefrom. A profuse flow of blood bursts from the ulcerated surface, perhaps twelve, fifteen, or twenty days after the vessel has been injured, and, if active means are not speedily adopted, the hemorrhage, by its recurrence, may prove very dangerous. In such cases compression is of no avail; the bleeding may be staid for a time by this means, but upon the circulation again becoming active, fresh hemorrhage must, and does take place; the parts around are infiltrated and engorged more and more, the blood escapes in alarming quantities, and the patient is saved only by the occurrence of syncope. To search for and discover the bleeding orifice by a clean dissection in such a case is impossible. In such cases, however, acupressure applied on both the proximal and distal sides of the bleeding spot should first be tried, and if this proceeding fails, the following should be adopted: "A long and deep incision must be made through the swollen and diseased parts in the course of the arterial branch, and a ligature passed under it, on each side of the ulcerated point, by means of the common curved suture-needle, or of one in a fixed handle. The ligatures should be at a considerable distance from each other, in order that they may surround healthy parts of the vessel; after they have been firmly tied, all risk of further hemorrhage is gone. Of course the ligatures should inclose as little as possible of the parts surrounding the artery. A poultice is perhaps the best application for a few days, and under its soothing influence the effects of the continued compression, which had been previously employed, soon subside." (*Liston.*)

6. *Poisoned Wounds of the Scalp.*—The integuments of the human head are peculiarly exposed to the envenomed stings of certain gregarious members of the order *hymenoptera*—for example, honey-bees, wasps, hornets, etc. The wounds thus produced consist of minute punctures, extending not unfrequently into the subcutaneous connective tissue, into which there is injected an animal virus, or venom, of considerable potency. The symptoms attending this kind of injury are mainly referable to the operation of this poison. They consist of burning pain in the wounded part of a severe and persistent character, together with inflammatory swelling of a strongly erysipelatous tendency. The pain follows the infliction of the wound immediately, and the redness, heat, and swelling come on soon afterwards.

Bee-stings of the cranial integuments, I am convinced from personal experience, prove more troublesome and dangerous than bee-stings on any other part of the body, except the mouth and fauces. Persons stung on the head by bees, according to my observations, often show the constitutional effects of the virus in a marked degree, the symptoms whereof are debility, faintness, chilliness, trembling, cold sweating, dyspnoea, and vomiting. In some rare instances bee-stings of the scalp have been found to prove quickly fatal. Such cases are mentioned in the secular journals

every summer. For example, it was stated in the scientific column of a prominent daily, some months ago, "that an aged labourer in Wales was lately killed by the sting of a bee behind the ear." Again, it was stated in the same journal, at another time, that "a Mrs. Strong, the wife of a blacksmith, and the mother of several children, was stung by a honey-bee while picking apples in the orchard, and died from the effects of it in about ten minutes after going to her room. The poison took effect so rapidly that the head was swollen to twice its natural size in less than an hour." The medical journals also make mention of similar cases. For example, the *Lancet*, July 27, 1872, states that on July 19, a female, aged fifty-five, was stung by a bee behind the ear. Shortly afterwards she became unconscious, and soon died. Her brother testified at the inquest that she was of a nervous and delicate constitution; that in the autumn of 1870 she became unconscious, and remained in that state for two hours in consequence of having been stung by a bee. The *Lancet* (*loc. cit.*, pp. 135, 136) further says: "Dr. Tanner quotes a case from the *American Journal of the Medical Sciences*, of a man who suffered very seriously in the month of August, 1819, from the single sting of a bee, and who being stung a second time (on the temple) in the following year, died from the effects thereof within ten minutes. Two or three other cases of fatal result are quoted by the same author; but happily such an occurrence is exceedingly rare. The advice given by the coroner, Dr. Diplock, to give stimulants freely in such cases, is undoubtedly founded on sound principles, the immediate cause of death being apparently failure of the heart's action."

Again, the following case of rapid death from stings of bees, reported by Dr. J. O. Sanders, Carrolton, Mississippi, is quoted in *New Remedies* for 1873 (p. 157):—

"April 18, I was called to see a patient stung by bees. Mr. S., an intelligent man, gave the following account: Louis —, a negro, aged about forty-five, climbed a tree where bees had swarmed on a limb, for the purpose of hiving them, carrying with him a saw. As soon as the limb commenced falling, the bees arose *en masse*, and covered his head and face. He descended immediately, and, as soon as he reached the ground, commenced running as fast as he could; ran around three sides of a yard, some two hundred steps, passed through an open gate, and fell to the ground. Mr. S. ran to him with a bottle of spts. camphor, and succeeded in forcing him to take one swallow; the patient protesting at the time against assistance, declaring that he would certainly die. After two or three irregular and partial respirations he expired. Mr. S. thinks it could not have been more than five minutes from the time he was attacked by the bees before he breathed his last. When I arrived, about an hour and a quarter after the accident, I could, on careful examination, find no signs of life. He was a vigorous, muscular man, and in perfect health, so far as I can learn. Was death due, in this case, to direct nervous shock, or to absorption of virus, or both?"—*Medical News*.

The following case occurred under the personal observation of the writer:—

CASE VII. *Multiple Bee-stings of the Scalp, accompanied by severe constitutional symptoms, and followed by Erysipelatous Inflammation of the Head and Face; Recovery.*—O. G. R., a robust young man, aged 22, a farm-labourer, while hiving a swarm of bees on the limb of an apple tree, was stung by them several times in the forehead. The injured parts immediately became the seat of intense burning pain and began to swell. The tumefaction increased rapidly and extended widely. The inflammation was diffuse in character, the skin dark red and hot. It soon extended to his face, and in a few hours his eyes were closed from tumefaction of the lids, his countenance became much distorted, and his ears involved in the morbid process. The stings, however, continued to be the principal seat of the pain, which remained severe and burning in character. The stingers had been left in the wounds by the insects.

He also exhibited decided evidences of constitutional disturbance. Soon after being stung he complained of feeling weak, faint, and chilly, and also vomited. This depressed condition of his system was followed by considerable reaction of a sthenic character. He then became feverish, thirsty, and restless. On the second day the erysipelatous inflammation of his head and face began to decline, and in a few days thereafter entirely disappeared, tarrying longest, however, at the wounds.

The remedial measures employed were of a simple nature. The stingers were extracted with tweezers, and then the affected parts were kept wet with a cold lotion which consisted of spirits of camphor and water. He kept his bed, and a dose of magnesium sulph. was administered after the fever came on.

In regard to the treatment of the stings of bees and other venomous insects the best plan is, after extracting the stingers, to apply liquor ammoniæ freely to the injured parts, with a view to decompose the venom and thus render it harmless. When the prostration due to absorption of the poison into the system is considerable, a few drops of the ammonia mixed in water should be administered by the mouth; and when it is very great the ammonia should be administered hypodermically, in sufficiently large doses to prevent the occurrence of cardiac paralysis. The diffuse inflammation of the injured parts generally requires the application of cold lotions, of which the lead and opium wash is one of the best.

46 WASHINGTON SQUARE, January 1, 1879.

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## ARTICLE II.

EXPERIMENTS AND REFLECTIONS UPON ANIMAL HEAT. By AUSTIN FLINT, Jr., M.D., Professor of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York, etc. etc.

HAVING had occasion recently to study the question of the force-value of food in connection with investigations into the source of muscular power, and the laws of conservation of force as applied to the theories of muscular action, I became much interested in the subject of animal heat. The

theories of the mechanism of the production of heat by animals have lately assumed a very positive and definite form; and certain statements are now presented as facts, which appear to be entirely satisfactory to many physiologists. The question involved is one of great pathological as well as physiological importance. It is well known that the temperature of the deeper parts of the body, which are little exposed to external refrigerating influences, does not vary in health more than two or three degrees Fahrenheit, and that this temperature is, to a great extent, independent of that of the surrounding atmosphere. When, from any cause, whether it be external or internal, there is a tendency to an elevation of the animal temperature, the heat is kept at the normal standard mainly by evaporation from the surface of the skin. There is, indeed, a constant generation of heat within the body, which is sufficient to maintain the animal temperature and to compensate the loss of heat from the surface. It is evident that this internal production of heat is connected with the general process of nutrition, and that it must involve changes in the form of matter within the animal organism. Carbonic acid is constantly discharged from the body, and this is one of the most important products connected with changes in matters, which produce heat. The body as constantly consumes oxygen, and oxidation is a process connected with most of the changes involved in calorification.

It is evident that, in normal nutrition by food, the heat of the body must be maintained by changes which take place, either directly in the blood or indirectly in the tissues, in the alimentary matters, and that these changes involve oxidation to a very considerable extent. Under ordinary conditions of nutrition, it is assumed that the food furnishes all the material for maintaining the heat of the body and for the development of force in work such as the muscular work of respiration and circulation and general muscular effort. If no food be taken for a certain time, the heat of the body must be maintained and the work must be accomplished at the expense of the substance of the body itself, and the individual loses weight.

To furnish a positive scientific basis for the views above expressed, physiologists have burned various articles of food in oxygen and have thus calculated their heat-value. This has been expressed in what are called heat-units, the English value of a heat-unit being the amount required to raise one pound of water one degree of the Fahrenheit scale. It is also calculated that one heat-unit converted into force will raise 772 pounds one foot high, or is equal to 772 foot-pounds. The theory of the heat-value and the force-value of food, based upon these premises, is the following:

The heat-value of food may be expressed in a definite number of heat-units. A certain proportion of these heat-units serves to maintain the standard animal temperature. A certain proportion is converted into the



force used in the muscular work of respiration and circulation. A certain proportion is used in ordinary muscular work. If the supply of food be in excess of these various requirements, a certain part of it is not used and the body may gain in weight. If the supply of food, however, be below the demands of the system, a part of the tissues of the body itself is consumed, and there must be a loss of weight.

There is no objection to such a theory as the one just stated on the ground of want of simplicity or comprehensiveness; but it must be admitted that many of its essential propositions are of necessity wanting in accuracy. Suppose that it be assumed as true, for the sake of argument, that one heat-unit is capable of being transformed in the body into 772 foot-pounds of force. It must be proven that a certain definite amount of heat is produced by the body. A reasonably accurate estimate must be made of the force consumed in the muscular work of respiration and circulation, expressed in foot-pounds. The general muscular work of the body must also be computed in foot-pounds.

I do not propose to discuss, in this connection, the last two propositions, and I think I have shown, in another place, the enormous errors that exist in the calculations by which the muscular work of the body has been reduced to foot-pounds.<sup>1</sup>

I shall discuss, in this essay, the estimated heat-value of certain articles of food and experiments made with reference to the heat-units actually produced by the body. I shall then give an account of observations made upon my own person, in which I endeavoured to ascertain something definite with regard to the relations between the heat estimated as produced by the body, the loss of weight of the body during one day's abstinence from food, and the estimated heat-value of a carefully weighed quantity of food taken during one day.

*Estimated Heat-value of certain Articles of Food.*—Following the observations made by Fick and Wislicenus, in 1866, by which these observers attempted to show that nearly all the force resulting from muscular action is due to the oxidation of non-nitrogenized matters, physiologists have estimated the heat-value and the force-value of different articles of food. They have reasoned that the food, by its oxidation in the body, is capable of producing a certain amount of heat and that a part of this heat is converted into force. A method now employed to calculate the heat produced is to subtract the daily mechanical force expended from the total force-value of the food, the result giving the daily formation of heat. A recent writer estimates in this way that "between one-fifth and one-sixth of the total income is expended as muscular labour, the remaining four-fifths or five-sixths leaving the body in the form of heat."<sup>2</sup> The reduction of heat-units to units of force is made in accordance with Joule's formula, that one

<sup>1</sup> A. Flint, Jr., *Source of Muscular Power*, New York, 1878.

<sup>2</sup> Foster, *Text-Book of Physiology*, London, 1877, p. 323.

heat-unit (the heat required to raise the temperature of one pound of water one degree Fahrenheit) is equal to 772 foot-pounds, or will raise 772 pounds one foot high.

In 1866, Frankland made a number of calculations of the heat-units and the estimated force-value of various articles of food<sup>1</sup> which are now accepted and used by most writers upon subjects connected with the theories of animal heat and the source of muscular power. The experiments upon which these calculations are based were made with great care and exactness. The following quotation gives, in a few words, the method employed :

“In order to estimate the amount of actual energy generated by the oxidation of a given amount of muscle in the body, it is necessary to determine, first, the amount of actual energy generated by the combustion of that amount of muscle in oxygen, and then to deduct from the number thus obtained the amount of energy still remaining in the products of oxidation of this quantity of muscle which leave the body. Of these products, urea and uric and hippuric acids are the only ones in appreciable quantity which still retain potential energy on leaving the body, and of these the two latter are excreted in such small proportions that they may be considered as urea without introducing any material error into the results.

“These determinations were made in Lewis Thompson’s calorimeter, which consists of a copper tube to contain a mixture of chlorate of potash with the combustible substance, and which can be inclosed in a kind of diving-bell, also of copper, and so lowered to the bottom of a suitable vessel containing a known quantity (2 litres) of water. The determinations were made with this instrument in the following manner : 19.5 grams of chlorate of potash, to which about  $\frac{1}{10}$ th of peroxide of manganese was added, was intimately mixed with a known weight (generally about 2 grams) of the substance whose potential energy was to be determined, and the mixture being placed in the copper tube above mentioned, a small piece of cotton thread, previously steeped in chlorate of potash and dried, was inserted in the mixture. The temperature of the water in the calorimeter was now carefully ascertained by a delicate thermometer, and the end of the cotton thread being ignited, the tube with its contents was placed in the copper bell and lowered to the bottom of the water. As soon as the combustion reached the mixture a stream of gases issued from numerous small openings at the lower edge of the bell and rose to the surface of the water, a height of about ten inches.

“At the termination of the deflagration, the water was allowed free access to the interior of the bell, by opening a stopcock connected with the bell by a small tube rising above the surface of the water in the calorimeter. The gases in the interior of the bell were thus displaced by the incumbent column of water, and by moving the bell up and down repeatedly a perfect equilibrium of temperature throughout the entire mass of water was quickly established. The temperature of the water was again carefully observed, and the difference between this and the previous observation determines the calorific power or potential energy, expressed as heat, of the substance consumed.

“The value thus obtained is, however, subject to the following corrections :—

“1. The amount of heat absorbed by the calorimeter and apparatus employed, *to be added*.

“2. The amount of heat carried away by the escaping gases, after issuing from the water, *to be added*.

“3. The amount of heat due to the decomposition of chlorate of potash employed, *to be deducted*.

“4. The amount of heat equivalent to the work performed by the gases generated in overcoming the pressure of the atmosphere, *to be added*.”<sup>2</sup>

<sup>1</sup> Frankland, On the Origin of Muscular Power.—Philosophical Magazine, London, 1866, vol. xxxiii., p. 182 *et seq.*

<sup>2</sup> Frankland, in Bence Jones, Croonian Lectures on Matter and Force, London, 1863, p. 141 *et seq.*

It is evident that the determinations made in the manner above described, care being taken to make the corrections indicated (which can be done without difficulty), give the amount of heat produced by the simple burning of the articles employed. As regards the heat produced by the oxidation of these substances in the body, if it be assumed that the same quantity of heat is produced by the oxidation, under all circumstances, of a definite amount of oxidizable matter, it is necessary simply to deduct from the heat-value of articles of food the heat-value remaining in the certain parts of the food which pass out of the body in an unoxidized state. It was in this way that Frankland arrived at a determination of the heat-value of articles of food oxidized in the body.

*Estimated amount of Heat actually produced by the Body.*—In January, 1872, Senator made an elaborate series of observations upon dogs, in which he attempted to ascertain the actual quantity of heat produced by the body per hour per kilogramme of body-weight. The principle upon which these observations were made was essentially the same as that which underlies the experiments of Frankland upon the amount of heat produced by the oxidation of alimentary matters. The animals experimented upon by Senator were inclosed in a copper cage which corresponds to the bell of copper in Thompson's calorimeter. The cage was supplied with a current of air, the temperature of which was carefully noted as it entered and passed out. The apparatus was immersed in a known volume of water, the temperature of which was noted at the beginning and at the close of each observation. The so-called combustion processes taking place in the body of the animals correspond to the deflagration of the alimentary substances in Frankland's experiments. The variations in the temperature of the animals and the loss of heat by the cooling of the apparatus itself were noted and used as corrections. In five experiments, the animals remaining in the apparatus for one hour in each observation, the gain in temperature of the water, all the necessary corrections being made, gave an average of 12.63 heat-units for an average weight of the animals of 5.383 kilogrammes;<sup>1</sup> that is to say, the increase in temperature of the water surrounding the cage in which the animals were inclosed was equal to 12.63° C. for each kilogramme of water. Reducing these results to the heat-units produced per kilogramme of weight of the body of the animal, there was a production of 2.34 heat-units per kilogramme of weight. The heat-unit calculated by Senator represents the raising of one kilogramme of water one degree Centigrade. One degree Centigrade equals 1.8° Fahrenheit. Reducing the heat-units, therefore, to the Fahrenheit scale, we should have the 2.34 heat-units equal to 4.212 heat-units Fahren-

<sup>1</sup> Senator, Untersuchungen über die Wärmebildung und den Stoffwechsel.—Archiv für Anatomie, Physiologie, und Wissenschaftliche Medizin, Leipzig, 1872, S. 20. In Senator's experiments, estimates were made of the exhalation of carbonic acid during each observation which I do not introduce into the discussion.

heit. As the heat-units used by Senator are per kilogramme of weight of the body and per kilogramme of water, the figures are the same when we make the calculation for a pound of water and a pound weight of the body. Reduced to heat-units representing the raising of one pound of water one degree Fahrenheit for each pound of weight of the body, we have, as the result of Senator's observations, a production of 4.212 heat-units per hour per pound of body-weight.

In December, 1872, Dr. John C. Draper, of New York, made a series of observations upon his own person, similar to those of Senator upon dogs. In these observations, he lay for one hour in a bath of a known volume of water. After making the necessary correction for the absorption of heat from the atmosphere by the water, which was  $\frac{1}{2}^{\circ}$  Fahr., he ascertained that he warmed "seven and one-half cubic feet of water two degrees in one hour." He estimated the volume of the body at three cubic feet, from which he calculated that "enough heat is evolved in the course of one hour to warm the body itself about five degrees of Fahrenheit's scale."<sup>1</sup> Two experiments made in this way on two successive days gave identical results. In both of these experiments, the temperature in the mouth on entering the bath was  $99^{\circ}$  Fahr. After one hour in the bath, the temperature in the mouth was  $98^{\circ}$  Fahr., showing a reduction in the temperature of the body of one degree. The temperature of the water at the beginning of the experiment was  $74^{\circ}$ . I shall assume, therefore—though this correction was not made by Draper—that, of the five degrees calculated as gained by three cubic feet of water and derived from the body, one degree was due to the cooling of the body, leaving four degrees of heat actually produced by the body in the hour. A given weight of the body being capable of warming an equal weight of water four degrees Fahrenheit in one hour, it follows that the body produces four heat-units per pound per hour, the heat-unit representing the raising of one pound of water one degree Fahrenheit.

The results obtained by Draper correspond very closely with those given by Senator. There is no reason to doubt the accuracy of the observations of either of these experimenters. It may be objected to Draper's experiments that the body in a bath is not under conditions absolutely physiological; but the condition of the dogs in Senator's experiments was not so abnormal as to seriously impair the value of his conclusions. In the applications which I shall make of the results of these experiments to my own observations, I shall assume that the body produces four heat-units per pound weight per hour.

In the same way it may be assumed that there is no reason to doubt the accuracy of Frankland's observations showing the heat-units produced by the oxidation of various articles of food. I shall therefore regard the

<sup>1</sup> Draper, *The Heat Produced in the Body, and the Effects of Exposure to Cold.*—*American Journal of Science and Arts*, New Haven, December, 1872.

determinations made by Frankland as definite propositions in the discussion which is to follow.

*Conversion of Heat into Force in the Body.*—In 1842, Dr. J. R. Mayer published an essay on the forces of inorganic nature, which is regarded as the starting point of the modern theories of the correlation and conservation of forces. These theories, which were at first applied to the forces developed by chemical changes in inorganic matters, have recently been applied to the production of heat and the development of force in animal bodies. It is not surprising that the theory alluded to should be thus applied. Physiologists have long been seeking for an expression of the phenomena of animal heat and force in definite quantities, and they have endeavoured to show that these phenomena are in accordance with certain laws which are applicable to the inorganic world. With our present knowledge, the idea of the actual generation or the total destruction of a single atom of matter is inconceivable. Matter changes its form, its characters, and the arrangement of its elementary constituents; but matter itself is indestructible. It is impossible, also, to conceive of force without matter. Philosophers regarding matter as indestructible, the idea of the indestructibility of force naturally follows; and, as matter undergoes changes by different arrangements of chemical elements, may there not be different kinds of manifestation of force which are interchangeable and interconvertible? The first step in the formulization of such an idea is the establishment of a unit of force which can be used to represent all dynamic manifestations; and the simplest way in which this can be expressed or defined is to measure all force by the power required to raise a certain weight a certain distance above the surface of the earth. We therefore express our idea of the quantity of any force in the raising of a given number of pounds to the height of a certain number of feet.

It is evident that the heat developed by chemical changes may be used in the production of power. We are in the habit of measuring heat by the expansion of some substance, such as mercury, and this is reduced to the degrees of an established scale. English writers have fixed upon a definite unit of heat, which is the amount required to raise one pound of water one degree in the Fahrenheit scale.

We thus have two fixed quantities to give form to our ideas of heat and force; a heat-unit, which equals one pound of water raised one degree Fahrenheit, and a unit of force, which equals one pound weight raised one foot high.

The line of reasoning adopted by Mayer is briefly the following:<sup>1</sup> An effect has a cause. Force is a cause which may produce a certain effect. A body cannot fall to the earth without having been raised to the height

<sup>1</sup> Mayer. *The Forces of Inorganic Nature.*—Correlation and Conservation of Forces, New York, 1868, p. 251 *et seq.*

from which it falls. The cause  $c$  has an effect  $e$ , which effect may itself act as a cause and produce a second effect  $f$ .

"If the given cause  $c$  has produced an effect  $e$  equal to itself, it has in that very act ceased to be:  $c$  has become  $e$ ; if, after the production of  $e$ ,  $c$  still remained in whole or in part, there must be still further effects corresponding to this remaining cause: the total effect of  $c$  would thus be  $>e$ , which would be contrary to the supposition  $c=e$ . Accordingly, since  $c$  becomes  $e$ , and  $e$  becomes  $f$ , etc., we must regard these various magnitudes as different forms under which one and the same object makes its appearance. This capability of assuming various forms is the second essential property of all causes. Taking both properties together, we may say, causes are (quantitatively) *indestructible* and (qualitatively) *convertible* objects."

The line of reasoning followed by Mayer leads him to conclude that, the force exerted by a falling body ("falling force") being equal to the force which has raised the body to the height from which it has fallen, this "falling force" itself acts as a cause and produces an effect. The first cause  $c$  equals the effect  $e$ , and the effect  $e$ , acting as a cause, equals the second effect  $f$ .  $c=e=f$ . Consequently,  $f=c$ . The effect  $f$  is expressed in an elevation of temperature. The first cause  $c$  finally produces  $f$ ; and, as the falling of a definite weight a certain distance produces a definite amount of heat, the heat thus produced is equal to the force required to raise the weight to the height from which it has fallen. The following are the conclusions arrived at by Mayer by this course of reasoning.

"By applying the principles that have been set forth to the relations subsisting between the temperature and the volume of gases, we find that the sinking of a mercury column by which a gas is compressed is equivalent to the quantity of heat set free by the compression; and hence it follows, the ratio between the capacity for heat of air under constant pressure and its capacity under constant volume being taken as  $=1.421$ , that the warming of a given weight of water from  $0^{\circ}$  to  $1^{\circ}$  C. corresponds to a fall of an equal weight from the height of about 365 metres.<sup>1</sup> If we compare with this result the working of our best steam engines, we see how small a part only of the heat applied under the boiler is really transformed into motion or the raising of weights; and this may serve as justification for the attempts at the profitable production of motion by some other method than the expenditure of the chemical difference between carbon and oxygen—more particularly by the transformation into motion of electricity obtained by chemical means."

In an essay upon the "Correlation of Physical Forces," by Grove, is a very clear and succinct account of the experiments of Joule,<sup>2</sup> whose results are those most generally adopted and used at the present day:

"Mr. Joule has made a great number of experiments for the purpose of ascertaining what quantity of heat is produced by a given mechanical action. His

<sup>1</sup> The above reduced to a degree of Fahrenheit and to feet gives the following: One heat-unit Fahrenheit, or one pound of water raised one degree Fahrenheit, equals one pound weight raised to the height of 665 feet, or 665 foot-pounds.

The following note is added by the translator of Mayer's essay:

"When the corrected specific heat of air is introduced into the calculation this number is increased, and agrees then with the experimental determinations of Mr. Joule."

<sup>2</sup> Joule's original essay is in the Philosophical Transactions, 1850, p. 61, and is entitled "On the Mechanical Equivalent of Heat."

mode of experimenting is as follows: An apparatus formed of floats or paddles of brass or iron is made to rotate in a bath of water or mercury. The power which gives rise to this rotation is a weight raised like a clock-weight to a certain height; this by acting during its fall on a spindle and pulley communicates motion to the paddle-wheel, the water or mercury serving as a friction medium and calorimeter; and the heat is measured by a delicate mercurial thermometer. The results of his experiments he considers prove that a fall of 772 pounds through a space of one foot is able to raise the temperature of one pound of water through one degree of Fahrenheit's thermometer. Mr. Joule's experiments are of extreme delicacy—he tabulates to the thousandth part of a degree of Fahrenheit, and a large number of his thermometric data are comprehended within the limits of a single degree. Other experimenters have given very different numerical results, but the general opinion seems to be that the numbers given by Mr. Joule are the nearest approximation to the truth yet obtained."<sup>1</sup>

I have thus given as plain a statement as I could make of the experiments upon which the prevailing theories of the mechanical equivalent of heat are based. The experimental fact involved is the production of heat by force. Algebraically, the equations seem unquestionable. Cause = effect; effect acting as a second cause = a second effect, which is heat; consequently the first cause, which is a definite amount of force, = the second effect, which is a definite amount of heat, and conversely the heat = the force. The experimental demonstration is the production of a certain quantity of heat by falling force, but never the production of the same amount of force by the heat. We can readily understand how there must be, in machinery constructed to produce force by heat, as in a steam-engine, such a waste of heat as to actually give much less useful force than is really equivalent to the heat employed. Viewed in this way, the question rests within the province of pure physics; but when the law of the correlation and conservation of forces is applied to animal mechanics, it is not difficult to see that the argument is entirely one-sided. The operations involved in the theory under consideration are simply two; viz., the production of animal heat and muscular force, the latter including the force used in circulation and in the movements of respiration. In animal mechanics, heat is never produced by force, but it is the theory that force results from a transformation of the heat remaining after sufficient heat has been produced to keep up the constant animal temperature. According to the present theory, physiologists must always reason in one direction, from the transformation of heat into force, while the physical basis of the theory consists of experiments in an opposite direction, the transformation of force into heat. Looking at the question in its relations to physiology, while I cannot say that, in an equation, if  $a = b$ , the converse,  $b = a$ , is not a self-evident proposition, I am not prepared to admit, without some experimental proof, the theory that one heat-unit produced in the animal body is equivalent to 772 foot-pounds of force. I fully appreciate the seeming temerity of an expression of want of perfect faith in the

<sup>1</sup> Grove, Correlation of Physical Forces.—The Correlation and Conservation of Forces, New York, 1868, p. 33.

doctrine of the convertibility of a certain quantity of heat into a definite quantity of force in animal bodies. It is enough to say that this dogma is accepted by Helmholtz, Faraday, Liebig, Carpenter, and, indeed, by nearly all modern philosophers. But, will this theory accord with all established physiological facts? This is the question that I propose to discuss, carefully considering the experimental basis of the facts that I shall bring forward, and allowing, in my discussion of these facts, for all elements of possible error and inaccuracy. The following propositions, which I make in advance of my discussion, I shall attempt to sustain by experiments quite as positive in their results as those of Mayer and of Joule :

1. While experiments have shown that the fall of 772 pounds through a distance of one foot, or the fall of one pound through a distance of 772 feet, will produce a quantity of heat that will raise the temperature of one pound of water one degree Fahrenheit, there is no positive experimental proof that such a quantity of heat will raise 772 pounds one foot, or one pound 772 feet.

2. The application to animal physiology of the law that one heat-unit is equal to 772 pounds of force is by no means a logical necessity. It is not adequately supported by experimental facts, partly for the reason that there are no accurate formulæ which will enable us to express the force used in circulation, respiration, and general muscular effort in definite units such as foot-pounds.

The experiments of Frankland, which I have already discussed, show that certain articles of food, when oxidized, produce a certain quantity of heat. It may be assumed that the amount of heat thus produced will always be the same whether the oxidation be slow or rapid. Animal heat and the force exerted by the body must be derived, directly or indirectly, from food. The quantity of food taken within a certain time can be measured, and the heat-value of such food may be determined. If the food taken can be shown to possess a heat-value which is manifestly in excess of the total ascertainable heat and force developed in the body, we can understand how a certain amount may pass away in such a manner that we cannot with certainty determine how it is lost. Experimental methods in physiology are not so exact as to enable us to follow all the changes which take place in the body, as is well known. But if, on the other hand, the estimated heat-value of food should fall far short of accounting for the heat and force generated in the body, there would seem to be a fatal error either in the law or in its application.

Experiments have been made by precisely the same methods as those by which the heat-value of articles of food has been established, showing that a warm-blooded animal or a man produces a definite amount of heat per hour per pound weight of the body. These experiments I have already discussed. There is no more reason to doubt their accuracy than



there is to question the results of the experiments of Frankland upon the heat-value of articles of food. In order to show that the application of the law of the relations between heat and force to animal mechanics is correct and that the law itself is correct, we must, as a logical necessity, be able to account for the heat and force developed in animal bodies by the heat-value of food, or of body-weight consumed, when the food is insufficient. If we have correctly estimated the heat-value of food, if we have also correctly estimated the heat and force developed in the body, there must be an error in the calculated relations between heat and force, if physiological facts do not sustain our theory. A serious defect in the theory that a certain amount of heat is equal to a certain amount of force is that no one has been able to show the actual conversion of one heat-unit into any number approaching that of 772 foot-pounds of force.

*Observation 1.*—In 1870, I had occasion to note the work, the quantity of food taken, and various other conditions, in a healthy man for several consecutive days. The observations were made at that time with another object in view; but the data obtained will serve in the present argument. I shall here make use of the estimates made for five consecutive days.

During the five days, the total amount of nitrogen in the food was 1173.82 grains. It is estimated by Dr. Pavy,<sup>1</sup> according to the observations of Frankland, that one ounce (437.5 grains) of dry albuminous matter, as consumed within the body, is equal to 165.20 foot-tons of force. Dr. Pavy computes, from Mulder's analysis, that 15.5 is the percentage of nitrogen in dry albuminous matter. According to this computation, 1173.82 grains of nitrogen represent 7573.03 grains, or 17.31 ounces of dry albuminous matter. During these five days, there was a loss of body-weight of 3.45 pounds. The subject of the experiment walked 317½ miles in the five days, and, at the beginning of the walk, had no appreciable fat. I therefore estimated the loss of weight as muscular tissue and calculated it as equal to 724.5 grains of nitrogen, equivalent to 4674.20 grains, or 10.68 ounces of dry albuminous matter.<sup>2</sup> The total force-value, then, of nitrogenous food and of loss of body weight (27.99 ounces of dry albuminous matter) was 4623.95 foot-tons, or 10,357,648.00 foot-pounds, equal to 13,416.64 heat-units.

I carefully estimated, for the five days, the heat-value of the non-nitrogenized food (milk, bread, oatmeal, potatoes, butter, and sugar). The heat-value of this food, calculated from Frankland's tables, amounted to 19,521.41 heat-units.

The following gives the total heat-value of the food and loss of body weight for five days:—

	Heat-units.
Nitrogenized food and loss of body weight . . . . .	13,416.64
Non-nitrogenized food . . . . .	19,521.41
Total sources of heat give . . . . .	32,938.05

The observations of Senator upon dogs and those of Draper upon his own person show that the actual quantity of heat produced by the body

<sup>1</sup> The Lancet, Dec. 16, 1876, p. 849.

<sup>2</sup> According to Payen, lean meat, uncooked, or muscular tissue, contains three per cent. of nitrogen. (Payen, Substances alimentaires, Paris, 1865, p. 488.)

is equal to at least four degrees Fahrenheit per pound weight per hour, which gives ninety-six degrees per pound weight for twenty-four hours. The subject of my observations had an average weight, for five days, of  $115\frac{1}{2}$  pounds. He consequently produced 11,088 heat-units in twenty-four hours, and 55,440 heat-units in the five days. The estimate of four degrees per pound per hour is for perfect repose. If this estimate be correct for repose, the subject of my experiment must have produced much more heat during the exertion of walking  $317\frac{1}{2}$  miles in five days. Taking the estimate of four degrees, however, we have the following:—

Heat-units produced by the body in five days . . . . .	55,440.00
Heat-value, in heat-units, of food and loss of body weight . . . . .	32,938.05

Heat-units unaccounted for . . . . .	22,501.95
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In the above calculation, no account is taken of the force exerted in walking  $317\frac{1}{2}$  miles or of the force employed in circulation and respiration. The estimates of the amount of force used in circulation and respiration are of necessity merely approximative. According to Letheby, it amounts to about 600,000 foot-pounds per day,<sup>1</sup> or 3,000,000 foot-pounds in five days, which equal 3886.00 heat-units. It is even more difficult still to estimate the force used in walking  $317\frac{1}{2}$  miles. An estimate has been made, however, of the force used in walking on a level, by Prof. Haughton. This estimate is that the work accomplished is equal to raising one-twentieth of the weight of the body through the distance walked, assuming the rate of speed to be three miles per hour.<sup>2</sup> For sake of argument I shall use this estimate, although I have little confidence in its accuracy, and the rate of speed in walking the  $317\frac{1}{2}$  miles was between four and one-half and five miles per hour instead of three miles. The force, then, in walking  $317\frac{1}{2}$  miles was equal to 4321.33 foot-tons,<sup>3</sup> or 9,679,779.20 foot-pounds, equivalent to 12,538.57 heat-units. Taking all of these estimates, the total heat-units expended in five days would be as follows:

Heat-units produced (animal heat) . . . . .	55,440.00
Heat-units converted into force, expended in walking $317\frac{1}{2}$ miles (estimated) . . . . .	12,538.57
Heat-units converted into force expended in circulation and respiration (estimated) . . . . .	3,886.00

Total expended in five days . . . . .	71,864.57
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Total heat-units derived from all kinds of food and from loss of body weight . . . . .	32,938.05
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Unaccounted for . . . . .	38,926.52
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Taking the heat produced by the body in maintaining the standard temperature for five days as 55,440.00, and the total heat-value of all kinds of food and of loss of body weight as 32,938.05, we have about forty per cent. of the heat produced which cannot be accounted for in the estimates that I have given. Adding to the heat produced by the body the estimated heat-units converted into force and used in walking  $317\frac{1}{2}$  miles and in keeping up circulation and respiration, we have a total of 71,864.57

<sup>1</sup> Letheby, *On Food*, New York, 1872, p. 96.

<sup>2</sup> Haughton, *Principles of Animal Mechanics*, London, 1873, p. 57.

<sup>3</sup> A. Flint, Jr., *The Source of Muscular Power*, New York, 1878, p. 63.

heat-units, of which about fifty-five per cent. cannot be accounted for by the estimated heat-value of the food and of the loss of body weight.

These results are certainly most striking. It is admitted by those who adopt the theory that one heat-unit is equal to 772 foot-pounds, that in a machine, like a steam-engine, but a small fraction of the calculated value of the heat employed can be actually used or measured as force. As regards this fact, we are satisfied with the explanation that a large amount of heat is necessarily wasted. But suppose, instead of this, we burned coal in a steam-engine, the heat-value of which was equal to 12,000 heat-units, and produced thereby an amount of force (calculating that one heat-unit equals 772 foot-pounds) represented by 20,000 heat-units, leaving 8000 heat-units, or forty per cent. of the force actually produced, unaccounted for. In the face of such a demonstration, the theory that one heat-unit equals 772 foot-pounds would fall to the ground. Provided the experiments be correct, the same process of reasoning may properly be applied to the physiological problem. We start with the assumption that the oxidation of a definite amount of matter produces a definite amount of heat, be the process slow or rapid or be it in the animal machine or in a calorimeter. All food has a determinable heat-value. But the heat-value of the food compared with the amount of heat actually produced in the body in a given time leaves forty per cent. of the heat actually produced which cannot be accounted for. This large deficiency demonstrates the existence of some serious error which may be expressed in one or more of the following propositions :

1. There may be an error in calculating the heat-value of the articles of food.

2. It may be an error to assume that the heat-value of the changes which the food undergoes in the body is equal to the heat-value as calculated by experiments with the calorimeter.

3. There may be an error in the estimates of the amount of heat actually produced by the body.

If errors exist in any or in all of these propositions, they are very considerable.

Suppose, again, that we add to the heat used in maintaining the temperature of the body the heat-units converted into the force required for work. We have, of the heat-units required for all these processes, fifty-five per cent. unaccounted for. Added to the errors to be looked for in reasoning from the animal heat alone and taking no account of the work, we have possible errors which may be expressed in the following propositions :

1. There may be an error in assuming that one heat-unit equals 772 foot-pounds.

2. Assuming that there is no error in the first proposition, it may be

incorrect to assume that the value of the transformation of one heat-unit into force in the body is equal to 772 foot-pounds.

3. There may be, and there probably is, a considerable error in the formula by which the work of walking on a level is reduced to foot-pounds.

4. There may be, and there probably is, a considerable error in the estimate of the force used in circulation and respiration.

*Observation 2.*—Nov. 22, 1878, I began the following experiment, in which I fasted for twenty-four hours:

*Nov. 22d.* 5.10 P. M., I had an alvine dejection. 6.45 P. M., I dined heartily. 10.45 P. M., I ate three poached eggs and toast and drank half a pint of Bass's ale. I slept well during the night.

*23d.* 7.45 A. M., I emptied the bladder but failed to have a passage from the bowels. 8 A. M., I began my observations, having taken no food since 10.45 P. M. of Nov. 22. My body-weight, without clothing, was  $188\frac{1}{4}$  pounds. The temperature under the tongue, taken for five minutes, was  $99^{\circ}$  Fahr. I walked half a mile. 9 A. M., I drank 8 fluidounces of water. 10 A. M., I played at billiards for two and one-half hours and drank 8 fluidounces of water. 1.30 P. M., I walked a quarter of a mile. 2 P. M., hunger was quite distressing, but it was relieved by smoking. 3.30 P. M., I walked about a quarter of a mile. 4 P. M., I had hardly any sense of hunger. The temperature under the tongue, taken for five minutes, was  $98\frac{5}{8}^{\circ}$  Fahr. 5.30 P. M., I played at billiards for one hour. 7.30 P. M., I drank 4 fluidounces of water. I went to the theatre in the evening and walked about a quarter of a mile. 11.15 P. M., the temperature under the tongue, taken for five minutes, was  $99\frac{3}{8}^{\circ}$  Fahr. I slept rather uneasily during the night.

*24th.* 7.45 A. M., I emptied the bladder but could not secure an operation of the bowels. 8 A. M., the experiment was concluded. The body-weight, without clothing, was  $184\frac{3}{4}$  pounds. The temperature under the tongue, taken for ten minutes, was  $97\frac{3}{4}^{\circ}$  Fahr. I had fasted for about thirty-three hours, but I calculated the fast from 8 A. M., Nov. 23, to 8 A. M., Nov. 24, for twenty-four hours after digestion had probably been completed. I suffered from hunger only at about 11 A. M., 2 P. M., and 7 P. M., the hours when I habitually took food. The suffering from hunger was less than I had anticipated and was much relieved by smoking three cigars during the day, smoking very frequently and but little at any one time. It is proper to state that I am forty-two years of age, five feet ten and one-half inches in height, and that I have been in the habit of daily muscular exercise in a gymnasium for the past ten years. I have a rather unusual muscular development. The weather had been fair and partly cloudy, with a temperature of  $45\frac{1}{4}^{\circ}$  Fahr., an average of eight observations.

The urine passed during the day was collected and analyzed, with the following results:

Total quantity, 34 fluidounces. Reaction acid; colour and odour normal; specific gravity  $1023\frac{1}{2}$ ; no albumen; no sugar; nothing abnormal on microscopical examination.

An analysis of the urine was made by Dr. C. A. Doremus for urea and uric acid. The urea was estimated by Liebig's process, the standard solution having been carefully treated with pure urea. The uric acid was estimated by treating the urine for forty-eight hours with hydrochloric acid, all the corrections being carefully made. The results of these examinations were as follows:

Urea, 14.78 grains per fluidounce  $\approx$  502.52 grains in twenty-four hours  $\approx$  234.51 grains of nitrogen. Uric acid, 0.255 of a grain per fluidounce  $\approx$  8.67 grains in twenty-four hours  $\approx$  2.89 grains of nitrogen.<sup>1</sup>

The total quantity of nitrogen contained in the urea and uric acid eliminated in the twenty-four hours was 237.4 grains. It is estimated by Dr. Pavy, according to Frankland's observations, that one grain of urinary nitrogen is equivalent to an amount of nitrogenized tissue consumed which would produce 2.4355 foot-tons of force, or 7.067 heat-units.<sup>2</sup> The 237.4 grains of urinary nitrogen, therefore, would be equivalent to 1677.70 heat-units.

It is important, in following out the course of reasoning that I have attempted, to form an idea of the avenues of escape of the matter represented by the loss of body-weight during the twenty-four hours of abstinence from food. There was no passage from the bowels, and the loss of weight, therefore, must have taken place by the urine, skin, and lungs. The total loss of weight was 56 ounces. The water taken was 20 ounces, making 76 ounces. I passed 34 ounces of urine of a specific gravity of  $1023\frac{1}{2}$ , the actual weight of which was 36 ounces.<sup>3</sup> This leaves an actual loss of weight, deducting the weight of the urine, of 40 ounces. This 40 ounces must have escaped by the lungs and skin in the form of carbonic acid and water. No account was taken, in the experiment, of the actual amount of carbonic acid eliminated, and this I was forced to estimate. It is stated by Dr. Edward Smith, as the result of observations upon four persons whose average weight was 160 pounds, that the total quantity of carbon eliminated in twenty-four hours was 7.144 ounces in a condition of perfect rest.<sup>4</sup> This is equivalent to about  $8.327^b$  ounces for a weight of  $186\frac{1}{2}$  pounds, which was the mean weight for the day. Deducting the estimated carbon eliminated from 40 ounces, we have an elimination of a little less than 32 ounces of water by the pulmonary and cutaneous surfaces. This is rather less than the estimates given in most works on physiology, but the difference is not very considerable.<sup>6</sup> Returning to the elimination of car-

<sup>1</sup> I calculate the nitrogen by estimating that the proportion of nitrogen in urea is 0.466, and that the proportion of nitrogen in uric acid is one-third.

<sup>2</sup> The Lancet, Dec. 16, 1876, p. 849.

<sup>3</sup> A. Flint, Jr., Chemical Examination of the Urine, New York, 1878, p. 70, table.

<sup>4</sup> Edward Smith, Experimental Inquiries into the Chemical and other Phenomena of Respiration.—Philosophical Transactions, London, 1859, p. 692.

<sup>5</sup> In calculating the loss of weight by the lungs and skin, it is proper to estimate the weight of the carbon eliminated instead of the weight of the carbonic acid, for the reason that the carbon comes from the body and the oxygen which unites with it to form carbonic acid comes, at least indirectly, from the air. If we suppose that a certain quantity of the oxygen of the air unites with hydrogen to form water, which is thrown off, the weight of this oxygen should be deducted from the water; but experiments are wanting to show the amount of oxygen which combines in this way, and such a correction could not be made with any degree of accuracy.

<sup>6</sup> Valentin estimates the average pulmonary exhalation at about 19 ounces (A. Flint, Jr., Physiology of Man, New York, 1875, vol. i., p. 447). The estimate of the cutaneous transpiration is about 30 ounces (Ibid., vol. iii., p. 139). Taking into account the sea-

bon, it is estimated that one ounce of dry fat contains 345.6 grains of carbon.<sup>1</sup> An elimination, therefore, of 8.327 ounces of carbon would represent 10.541 ounces of dry fat. According to Frankland,<sup>2</sup> the heat-value of 10.541 ounces of fat is equal to 10,759.09 heat-units.

From these calculations we have, for twenty-four hours of fasting, the following sources of heat, which are capable of being estimated :

	Heat-units.
Heat-value of 237.4 grains of urinary nitrogen . . . . .	1,677.70
Heat-value of 10.54 ounces of fat . . . . .	10,759.09
Total . . . . .	12,436.79

Estimating the heat produced by the body at four degrees per pound per hour, for a weight of 186½ pounds—

	Heat-units.
We have produced in twenty-four hours . . . . .	17,904.00
Deduct . . . . .	12,436.79

Unaccounted for by urinary nitrogen and carbon excreted . 5,467.21

If we assume that the estimate of the heat-value of the urinary nitrogen be correct as well as the heat-value of the probable exhalation of carbonic acid, and if we assume that the estimated heat produced by the body be reasonably accurate, a little less than one-third of the heat produced during the twenty-four hours of fasting cannot be accounted for by the heat represented by the urinary nitrogen and the carbon eliminated.

This experiment, in which absolutely no food was taken, possesses many points of peculiar interest and advantage. In such an experiment, we have but three matters discharged from the body, that demand serious consideration ; viz., urinary nitrogen, carbonic acid, and water. We can calculate the amount of nitrogenized matter of the body represented by the urinary nitrogen and estimate its heat-value. We can also calculate the amount of fat represented by the carbonic acid discharged and estimate its heat-value. The only thing that remains is the water. From the estimates that have been made, there remain about 5500 heat units that cannot be accounted for by any heat-producing processes in the body represented by the amount of discharge of urea and carbonic acid. I have estimated that about 32 ounces of water are lost during the day by the lungs and skin. Of this 32 ounces, one-ninth, or 3.55 ounces, consists of hydrogen. It is estimated that one kilogramme of hydrogen will produce 34,600 heat-units C.,<sup>3</sup> and one pound, the same number represented in pounds, or 62,280 heat-units Fahr. The heat-value, then, of one ounce of hydrogen

son of the year and the small amount of exercise and water taken, the estimate of 32 ounces for both the pulmonary and the cutaneous exhalation seems to be reasonable.

<sup>1</sup> Pavy, Food and Dietetics, Philadelphia, 1874, p. 440, quoted from Parkes.

<sup>2</sup> Letheby, On Food, New York, 1872, p. 94.

<sup>3</sup> Mayer, Celestial Dynamics.—Correlation and Conservation of Forces, New York, 1868, p. 261.

would be 3892.5 heat-units, or 13,818,375 heat-units for 3.55 ounces. If it could be shown that water is actually produced in the body by a union of hydrogen and oxygen, and that a sufficient quantity of oxygen is not returned to the air in the form of carbonic acid to combine with even one or two ounces of hydrogen, we could account, not only for the heat actually produced in the body, but for the heat assumed to be converted into force to carry on circulation, respiration, and any ordinary muscular work. There would be little difficulty in accepting such a theory of the source of heat and force produced, if it could be shown that the heat generated in the body exceeds the ordinary requirements; but when the number falls very far short, it seems impossible that the theory should be correct. The question here touched upon will be referred to farther on and discussed more fully.

*Observation 3.*—November 30, 1878, one week after the date of *Observation 2*, having entirely recovered from the effects of the previous experiment, I began the following observation, in which the quantity and the heat-value of food taken for twenty-four hours were carefully noted and calculated.

At 8 A.M., I had a passage from the bowels. The weight of the body taken just afterward, without clothing, was  $186\frac{1}{4}$  pounds. The temperature under the tongue, taken for five minutes, was  $98^{\circ}$  Fahr.

At 8.45 A.M., I breakfasted as follows, taking each article from a separate plate, which was weighed before and after eating:

Lean beef-steak, 10 ounces, with bread, butter, and milk. The bread, butter, and milk were calculated for the twenty-four hours, and the bread-crum only was taken, without the crust.

At 1 P.M., I took a lunch of lean roast-beef, 6 ounces; boiled potatoes, 3.5 ounces, with bread-crum, butter, and milk.

At 5.30 P.M., the temperature under the tongue, taken for five minutes, was  $99\frac{3}{4}^{\circ}$  Fahr.

At 6.45 P.M., I dined on lean roast-beef, 10 ounces; fried potatoes, 3 ounces; Bass's ale, 24.5 ounces by weight, with bread-crum and butter.

At 12, midnight, the temperature under the tongue, taken for five minutes, was  $100^{\circ}$  Fahr. I retired and slept well during the night.

At 8 A.M., December 1, I had a passage from the bowels. The body-weight taken just afterward, without clothing, was  $186\frac{1}{4}$  pounds, exactly what it was at the beginning of the experiment. The temperature under the tongue, taken for five minutes, was  $98\frac{1}{4}^{\circ}$  Fahr. During the twenty-four hours, I had taken 10 ounces of bread-crum, 3.75 ounces of butter, and 34.5 ounces of milk. The weather had been fine, with a temperature of  $42\frac{7}{8}^{\circ}$  Fahr., an average of eight observations. I had eaten of the articles indicated all that was possible. During the day, I walked about two miles, played at billiards for about three hours, and smoked five cigars. A calculation of the heat-value of the food was made by the following table reduced to ounces, from Letheby,<sup>1</sup> and carefully corrected from the original tables of Frankland:

<sup>1</sup> Letheby, *On Food*, New York, 1872, p. 94.

*Heat-units per Ounce Av. of the following Articles of Food oxidized in the Body.*

Beef (lean) . . . . .	160.12
Bread-crum . . . . .	241.50
Potatoes . . . . .	112.00
Butter . . . . .	817.25
Milk . . . . .	71.75
Bass's ale (alcohol reckoned) . . . . .	87.06

According to this table, the following was the heat value of the food taken in the twenty-four hours :

	Heat-units.
Beef, 26 ounces . . . . .	4,163.12
Bread-crum, 10 ounces . . . . .	2,415.00
Potatoes, 6.5 ounces . . . . .	728.00
Butter, 3.75 ounces . . . . .	3,064.69
Milk, 34.5 ounces . . . . .	2,475.37
Ale, 24.5 ounces . . . . .	2,132.97
Total heat-value of food . . . . .	14,979.15

Estimating the production of heat by the body as equal to four degrees per pound per hour—

	Heat-units.
We have produced in twenty-four hours . . . . .	17,880.00
Heat-value of food . . . . .	14,979.15
Unaccounted for by the heat-value of food . . . . .	2,900.85

This calculation leaves about one-sixth of the heat produced by the body unaccounted for by the heat-value of the food taken.

*Possible Oxidation of Hydrogen in the Body, resulting in the Formation of Water and the Production of Heat.*—It is by no means a novel idea that oxygen may unite with hydrogen in the body to form water and produce heat;<sup>1</sup> but thus far there has been no experimental demonstration of the actual production of water in the animal economy. In the experiment in which I fasted for thirty three hours, for twenty-four hours of which no food was taken after the digestion of articles taken about nine hours before had been completed, I discharged about 32 ounces of water by the lungs and skin, and 34 ounces of water in the urine, making a total discharge of water of 66 ounces. During this period, I drank 20 ounces of water, leaving 46 ounces over and above the quantity taken. My loss of weight was 56 ounces, of which I estimate a loss of about ten ounces in solid matters in the urine and carbon by the lungs. The question now is whether this loss of 46 ounces of water was simply a discharge of water already formed, from the blood and the watery parts of the tissues, or whether it is to be attributed in part to water actually formed in the body by a union of oxygen and hydrogen. If the watery parts of the body be actually deficient in quantity, there is usually a sensation of thirst. I did not suffer from thirst, and, indeed, I drank rather more water than I desired.

<sup>1</sup> In 1780 and 1785, Lavoisier and Laplace advanced the view that animal heat was produced by the oxidation of carbon and hydrogen in the body.



Recent experiments by Valentin, Panum, Colin, and others, have shown, in opposition to the previously received opinions, that abstinence from food has very little effect in diminishing the volume of the blood.<sup>1</sup> This fact, taken in connection with the absence of thirst during the twenty-four hours of fasting, is favourable to the view that all of the excess of water discharged did not come directly from the blood.

If water be actually produced in the economy by a union of oxygen and hydrogen, what is the probable source of these two elements? There is no deficiency of hydrogen in the body, and, if it be used to form water which is discharged, there would be loss of weight when no food is taken, and it would be supplied by the food under ordinary conditions of nutrition. There is no deficiency of oxygen in the body itself, and the oxygen discharged in urea represents only about one-third of the proportion of oxygen contained in the nitrogenized constituents of the body. Of the oxygen taken into the lungs, about 86 per cent. only is returned in combination with carbon to form carbonic acid, leaving 14 per cent. to form some other combination in the body, possibly a union with hydrogen. There is, indeed, little or no difficulty in accounting for the elements to form water in the body, if it can be shown that more water is discharged from the organism than is taken with the ingesta, and that the excess thus discharged does not come simply from the watery parts, producing an actual deficiency of water in the body.<sup>2</sup>

The actual demonstration that more water is ever discharged from the body than can be accounted for by the water of the ingesta or by water simply withdrawn from the blood rendering this fluid more dense, presents very considerable but not insurmountable difficulties. A process that would be open to few objections, provided all of the elements used in the calculations were accurate, is the one which I have attempted to employ in cases of loss of weight. This process is the following :

Take the weight of a man at the beginning of the experiment, calculate accurately the weight of the ingesta for a certain period, and add this latter to the weight of the body. This forms the sum total from which certain quantities are to be deducted. Take then the weight of the urine and feces passed during the time of the experiment ; add to this the weight of the carbon contained in the carbonic acid exhaled, which carbon carries with it a portion of the inspired oxygen ; add both of these to the weight of the body taken at the close of the experiment ; the difference will give the amount of water discharged by the lungs and skin. Having thus the quantity of water discharged by the lungs and skin, to ascertain the total

<sup>1</sup> Robin, *Leçons sur les humeurs*, Paris, 1874, p. 50.

<sup>2</sup> Funke, *Lehrbuch der Physiologie*, Leipzig, 1876, Bd. i., S. 297. I have quoted from Funke the results obtained by Pettenkofer and Voit, and have taken as an average of their results, 833 grammes of oxygen consumed and 985.2 grammes of carbonic acid produced in twenty-four hours. 985.2 grammes of carbonic acid represent 716.5 grammes of oxygen.

quantity of water discharged from the body, we have to add the water contained in the urine and feces. We then carefully estimate the amount of water contained in the ingesta and can compare the amount of water discharged with the quantity taken. In Pettenkofer's chamber, in which a man may be confined and all of the excreta be estimated, these calculations could be made with sufficient accuracy, and the only uncertain element in the problem would be as to whether or not the blood became modified in density or volume. In the following calculation, I was forced to estimate the amount of carbon eliminated; but I endeavoured to correct this estimate by an indirect method, which will be described farther on. The subject of my experiment was the person mentioned in *Observation 1*, and the investigations described were continued for five days. The following is a summary of the results:

*Observation upon the Ingress and Egress of Water.*

	Ounces.
Body-weight at the beginning of the observation . . . . .	1,907.20
Weight of the ingesta for five days . . . . .	857.34
	<hr/>
Total . . . . .	2,764.54
Weight of the urine and feces for five days . . . . .	220.47
Carbon eliminated for five days, estimated at 10 ounces per day <sup>1</sup> . . . . .	50.00
Body-weight at the end of the five days (show- ing a loss of 55.2 ounces) . . . . .	1,852.00
	<hr/>
	2,122.47
	<hr/>
Water eliminated by the lungs and skin . . . . .	642.07
Water contained in the urine and feces . . . . .	208.89
	<hr/>
Total water discharged . . . . .	850.96

<sup>1</sup> As I have stated in the text, I was forced to estimate the amount of carbon discharged, but I preferred to put it too high rather than too low. Ten ounces per day is a very high estimate for a man weighing 115½ pounds. The following indirect calculation of the probable sources of carbon shows that this estimate is certainly sufficient. I calculate the total carbon of the food as amounting to about 25 ounces. To this I add the carbon of 48 ounces of muscular tissue consumed (5.28 ounces), and of 7.2 ounces of fat, both loss of weight (5.69 ounces). This gives about 36 ounces of carbon for five days. From this I deduct 9 ounces of carbon discharged in the urea, which leaves 27 ounces for five days, or 5.4 ounces per day. If I calculated that the entire loss of weight of 55.2 ounces should be estimated as fat—which is very improbable from the condition of the subject on beginning the walk, and the discharge of a considerable quantity of nitrogen from the body over and above the nitrogen of food—we should have about 59 ounces of carbon for five days, or 11.8 ounces per day. The last-named quantity would make very little difference in the results.

*Water of the Food for Five Days.*

Articles of Food.	Quantity. Ounces.	Quantity Water. Ounces.
Meat . . . . .	23.87	16.95
Eggs . . . . .	27.60	17.31
Milk . . . . .	36.03	31.34
Bread . . . . .	28.87	12.70
Beef-essence . . . . .	42.13	40.03
Oatmeal gruel . . . . .	18.09	17.19
Potatoes . . . . .	5.00	4.38
Butter . . . . .	4.88	0.73
Coffee . . . . .	287.09	278.48
Tea . . . . .	124.25	13.01
Water . . . . .	11.75	11.75
Lemonade . . . . .	227.16	227.16
Molasses and water . . . . .	4.40	4.18
Tomatoes . . . . .	3.12	2.97
Sugar, salt, pepper, bicarbonate of potash . . . . .	12.10	
	<hr/>	<hr/>
Total water discharged in five days . . . . .	857.34	788.18
Total water ingested in five days . . . . .		850.96
		<hr/>
Excess of water discharged in five days . . . . .		62.78
Excess of water discharged per day . . . . .		12.56

The heat-value of the hydrogen required to form one ounce of water is equal to 432.5 heat-units. The heat-value, then, represented by the formation of 12.56 ounces of water would be 5432.2 heat-units.

During these five days, the subject of this experiment walked  $317\frac{1}{2}$  miles and lost 55.2 ounces in weight. As will be seen by reference to *Observation 1*, I have calculated the total heat produced by the body, the heat-units used in maintaining circulation and respiration and in walking  $317\frac{1}{2}$  miles. I then calculated, also, the heat-value of the food and of the loss of body-weight, the latter estimated as muscular tissue, taking no account of the hydrogen. According to this calculation, there remained 38,926.52 heat-units unaccounted for. If we take in addition the heat-value represented by the excess of water discharged for the five days, which is equal to 27,161.00 heat-units, we have 11,765.52 heat-units unaccounted for, which is about sixteen per cent. of the heat-units expended, instead of fifty-five per cent. However, in estimating the heat-units used in respiration, circulation, and walking  $317\frac{1}{2}$  miles, I have taken calculations that I regard as grossly erroneous; and I used them for sake of argument and without any confidence in their accuracy. The percentage of sixteen is probably not more than the error in the computation of the heat-units converted into force expended in maintaining circulation and respiration and in walking  $317\frac{1}{2}$  miles.

One of the observations in which I calculated the amount of water discharged as compared with the quantity ingested was for twenty-four hours of abstinence from food. (See *Observation 2*.) The other was for a person who lost considerable weight as the result of excessive muscular

exertion. Even when no food is taken, a certain amount of heat must be produced, and the standard animal temperature must be maintained. The heat thus produced cannot be accounted for by the carbon discharged in carbonic acid, but it can be accounted for by the hydrogen discharged in water, and it seems reasonably certain that water is actually formed in the body. Under excessive exercise attended with loss of weight, it seems certain that water is produced in the body by a union of hydrogen and oxygen. Animal heat is undoubtedly produced very largely by oxidation; and it has been shown that muscular work, while it has a tendency to raise the animal temperature, very considerably increases the elimination of water.<sup>1</sup> The chemical products of this oxidation are represented mainly by urea, as far as nitrogen is concerned, by carbonic acid, and by water. There are thus three elements with which the oxygen combines; viz., nitrogen, carbon, and hydrogen. We cannot account for the total amount of heat produced in the body by the urea and carbonic acid discharged, but this can be accounted for by supposing that a certain quantity of hydrogen is oxidized in the body to form water.

I do not pretend to assert that the oxygen absorbed by the blood in its passage through the lungs forms a direct and immediate union with carbon and hydrogen to form carbonic acid and water. If such a union take place, carbonic acid and water are the final products resulting from a series of molecular changes, the various steps of which we are unable to follow; but it is probably true that, if a union of oxygen with carbon and hydrogen will produce a definite amount of heat, the quantity of heat is the same whether the combination be slow or rapid. As regards the oxidation of carbon and hydrogen, all that it is necessary to show is that carbonic acid and water are actually produced in the body, as a part of the final results of the intricate molecular changes involved in nutrition and disassimilation. There is no good reason to suppose that the processes of physiological wear or disassimilation of the tissues are radically changed in their character during a short period of abstinence from food, or during exercise which for a time wastes the tissues more rapidly than they can be repaired. When the appropriation of nutritive matters produces an equilibrium between the physiological waste and repair, it is logical to conclude that the waste of the tissues, which involves the oxidation of a certain quantity of carbon, nitrogen, and possibly hydrogen, is repaired by the food, the nature of the processes involved in the waste being the same as during a period of abstinence from food. As regards, therefore, the oxidation of hydrogen, we may suppose that the hydrogen of the non-

<sup>1</sup> Pettenkofer and Voit, as one of the conclusions arrived at by experiments upon a man 28 years of age, kept for twenty-four hours in their large respiration-apparatus, make the following statement: "The elimination of water is very much increased by work, and the increase continues during the ensuing hours of sleep." (*Journal of Anatomy and Physiology*, Cambridge and London, 1868, vol. ii. p. 181.)

nitrogenized parts is consumed, and that the matter thus consumed is supplied again to the tissues in order to maintain the physiological status of the organism.

The supposition that water may be actually formed within the organism under certain conditions not only completes the oxidation-theory of the production of animal heat, but it enables us to understand certain physiological phenomena that have heretofore been obscure. It is well known, for example, that a proper system of physical training will reduce the fat of the body to a minimum consistent with health and strength. This involves a diet containing a relatively small proportion of fat and liquids, and regular muscular exercise attended with profuse sweating. We have seen that muscular work increases the elimination of water, while it also exaggerates for the time the calorific processes. The muscular exercise undoubtedly favours the consumption of the non-nitrogenized parts of the body, and a diminution of the supply of hydrocarbons, carbohydrates, and water in the food prevents, to a certain extent, the new formation of fat. By taking an excessive quantity of liquids, we do not increase the calorific processes or promote activity of the circulation, and the excess of water is usually discharged by the kidneys. When, however, we exert the muscular system excessively, we increase the production of water and the circulation becomes more active. The volume of blood then circulating in the skin and passing through the lungs, in a given time, is relatively increased, and there is an increased discharge of water from these surfaces. The same condition that produces an increased quantity of water in the body and has a tendency to exaggerate the process of calorification seems to produce also an increased evaporation from the surface, which serves to equalize the animal temperature. It is stated by Mr. Maclaren, the author of an excellent work on training, that in one hour's energetic fencing, the loss by perspiration and respiration, taking the average of six consecutive days, was about three pounds, or, accurately, forty ounces, with a varying range of eight ounces.<sup>1</sup>

*Conclusions.*—I shall restrict the conclusions to be drawn from the experiments that I have described to points connected with the production of animal heat. It is undoubtedly true that, computing all of the force produced in the body as heat-units, more heat is generated than is absolutely necessary to maintain the normal animal temperature, and that a certain amount of this excess is manifested as force used in the work of respiration and circulation and general muscular effort. The computation of the force thus used is always made in accordance with the formula that one heat-unit is equivalent to 772 foot-pounds. The reduction of the force of the heart and the force exerted by the respiratory muscles to units of foot-pounds is so excessively difficult and uncertain that the

<sup>1</sup> Maclaren, Training, in Theory and Practice, London, 1866, p. 89.

estimates given by writers are, in my opinion, almost worthless. The same remark applies to the reduction of ordinary muscular work to definite units. Without some such reduction, the force exerted by muscles cannot be expressed in definite quantities. All that we can do is to show, if possible, that more heat-units are produced in the body than are required to maintain the heat of the body, and that a part of the excess is converted into force. I do not conceive that the simple experiment, which shows that one pound in falling 772 feet will produce heat enough to raise the temperature of one pound of water one degree Fahrenheit, proves absolutely that one heat-unit produced by burning food in oxygen, when the same food is oxidized in the body, making allowance for that which escapes such oxidation, can be converted into a muscular force equal to 772 foot-pounds.

The experiments which I performed were made under serious disadvantages. While it was not difficult to collect the urine and feces and to estimate the constitution of the food, I had no apparatus which would have enabled me to ascertain exactly the amount of oxygen absorbed and of carbonic acid exhaled for a number of hours. With such an apparatus as Pettenkofer's respiration-chamber, it would be possible to make an actual measurement of the quantity of oxygen absorbed and of carbonic acid and water excreted, and thus it might be shown whether or not water can be produced in the body; and, if it could be demonstrated that water can be thus produced, it could be ascertained what proportion of such water was probably produced by a union of a portion of the inspired oxygen with hydrogen, by simply deducting the oxygen used in the formation of carbonic acid from the total quantity consumed. Still, taking my experiments as they are, and connecting them with what had been previously ascertained with regard to the questions under consideration, I think I am justified in drawing from them the following conclusions:

1. It is probable, and, indeed, almost certain, that nearly all the animal heat is produced by oxidation, in the body, of certain elements, which are chiefly nitrogen, carbon, and hydrogen.

2. It is probable that this oxidation does not take place entirely in the blood, but that its seat is in the substance of the various tissues, and that it is connected with the general processes of nutrition and disassimilation. Heat is thus evolved, and the final products of the chemical actions involved are mainly urea, carbonic acid, and water. It must be remembered, however, that the oxidation is not necessarily a process identical with combustion out of the body, but that it is probably connected with a series of intricate molecular changes, which cease with the life of the tissues, and of which we are able to recognize only the final results; viz., calorification and certain chemical products.

3. Recognizing the products, urea, carbonic acid, and water, as representing probably the evolution of a certain amount of heat, we cannot

account for the heat actually produced in the body by the amount represented by the urea and carbonic acid discharged. If we admit that hydrogen is oxidized in the body, resulting in the evolution of heat and the production of water, this will enable us to account for all the heat actually manifested as heat, leaving an excess which may be converted into force.

4. My experiments show pretty clearly that, when no food is taken and when, food being taken, muscular work is performed, so that there is loss of body-weight, water is actually produced in the body. This, and this only, enables us to account for all the heat evolved under these conditions. There is no reason to suppose that the processes involved in the production of heat are radically changed in their character when enough food and water are taken to maintain a uniform body-weight.

5. Animal heat is produced mainly by oxidation of the nitrogen, carbon, and hydrogen of the tissues, the waste of these elements being supplied by the food. Probably the oxidation of carbon and hydrogen is a more important factor in calorification than the oxidation of nitrogen; at least it is certain that the heat-value of the oxidation of carbon and hydrogen is greater than that of the oxidation of nitrogen, and the quantity of heat thus produced is very much greater. Of the two elements, carbon and hydrogen, the oxidation of which produces animal heat, the heat-value of the hydrogen is by far the greater.

6. It is probable that there is always a certain amount of oxidation of hydrogen in the body, and that this is necessary to maintain the animal temperature; and it is almost certain that this occurs during prolonged abstinence from food and when the production of heat is much increased by violent and protracted muscular exertion. It may be, also, that there is an active and unusual oxidation of hydrogen as well as of carbon in fevers.

Alcohol, which is so extensively used as a measure of sustaining treatment in fevers, is now almost universally recognized as an element consumed in the body and not discharged to any considerable extent as alcohol. According to Brande,<sup>1</sup> Cognac brandy contains 46 per cent. of absolute alcohol. With a specific gravity of 0.930, one ounce of brandy weighs 406.875 grains and contains 187.1625 grains of alcohol. The alcohol, with a composition of  $C_4H_6O_2$ , contains 12.9 per cent. of hydrogen, or 24.14 grains, and 52.65 per cent. of carbon, or 98.54 grains. The heat-value of 24.14 grains of hydrogen equals 214.77 heat-units. The heat-value of 98.54 grains of carbon equals 182.44 heat-units.<sup>2</sup> Taking, then, the total heat-value of the hydrogen and carbon contained in one ounce of brandy, and taking no account of the oxygen contained, the heat-value amounts to 397.21 heat-units. If we assume that a man produces

<sup>1</sup> Brande and Taylor, Chemistry, Philadelphia, 1867, p. 583.

<sup>2</sup> Mayer, Celestial Dynamics.—Correlation and Conservation of Forces, New York, 1868, p. 261.

four heat-units per pound weight of the body per hour, the amount of heat normally produced in twenty-four hours by a man weighing 140 pounds is equal to 13,440 heat-units. The quantity of brandy required to supply this amount of heat, according to the calculations I have just made, would be a little less than 34 ounces. Theoretically, then, it is easy to see how alcohol may furnish material to supply heat and save waste of tissue in fevers. It is not very unusual, in certain stages of fever, to administer from 16 to 32 ounces of brandy in twenty-four hours.

I conclude this essay with the following query, which has occurred to my mind in connection with my reflections upon the question of the oxidation of hydrogen as one of the sources of animal heat:

If the excessive heat produced in essential fevers be due in part to an excessive oxidation of hydrogen, why would not the exhaustion and rapid emaciation which attend the progress of fever be more or less moderated by supplying hydrogen to the system in the form of fatty matters, starchy matters, sugar and alcohol, until the fever has run its course; and might not this supply, to a certain extent, the abnormal waste of tissue?

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### ARTICLE III.

CONTRIBUTIONS TO THE PATHOLOGY OF PERIPHERAL NERVE-DISEASES. By JULIUS ALTHAUS, M.D., M.R.C.P., Senior Physician to the Hospital for Epilepsy and Paralysis, Regent's Park, London.

INFLAMMATION of the nerves is by some pathologists considered to be an extremely rare, and by other a more common affection. Dr. Weir Mitchell, an American physician to whom we owe an able monograph on injuries of nerves and their consequences, of which he saw numerous examples during the American civil war, considers acute idopathic neuritis an uncommonly rare disease; while Benedict, Remak, and others, appear to have enjoyed almost daily opportunities of meeting with such cases. My own experience leads me to believe that instances of this description are certainly more common than is generally supposed, and that although the evidence of post-mortem examinations is as yet not large, nevertheless the clinical symptoms are in many cases sufficiently striking to warrant the diagnosis of neuritis or perineuritis. One special affection of this class has recently been very closely investigated—I allude to optic neuritis, in which the changes going on in the nerve may be closely followed by the aid of the ophthalmoscope; and the observations made on this disease by Von Graefe in Germany, and Drs. Jackson, Clifford Allbutt, and others in this country, have thrown considerable light on its



pathological relations. It is my purpose in the present communication to draw attention to the occurrence of inflammation in some other cranial nerves, where it has not yet received the amount of consideration which the interest of the subject seems to warrant. Indeed I have not been able to discover in medical literature any records of acute olfactory and auditory neuritis, of which I will relate instances which have fallen under my observation; while with regard to inflammation of another nerve—the portio dura of the seventh pair—indeed a considerable amount of information has been obtained, yet many of the clinical features of the affection are not as yet well known, although they are of great importance in their relation to diagnosis, prognosis, and treatment.

Inflammation may attack the entire structure of the nerve or only its investing membrane, the perineurium, which consists of connective tissue with small bloodvessels and nerves. According to this we speak of neuritis or perineuritis. The fundamental difference between the two diseases appears to me to be, that in neuritis the central core or cylinder axis undergoes the same degeneration as all the other portions of the nerve, while in perineuritis this important structure escapes destruction.

In acute neuritis there is at first hyperæmia, more particularly in the smallest veins and capillary vessels, and less in the arterioles. The nerve appears to the naked eye uniformly congested and livid, or dilated bloodvessels may be distinguished, more particularly in certain portions of the same, as, for instance, where it traverses an osseous canal, the walls of which are unyielding, and therefore add to the intensity of the inflammatory symptoms. The nerve is swollen, moist and turbid, and the smaller bundles of nerve-fibres are surrounded by a serous or fibrinous effusion which has a gray or reddish jelly-like appearance, and often contains hemorrhagic spots of variable size. If the nerve be examined microscopically, it is found that crowds of white blood-corpuscles have migrated into the sheaths of Schwann, and the septa of connective tissue, which divide the nerve into its smaller funiculi. The myeline or medullary substance of Schwann appears divided into segments; softening and supuration set in, and the structural elements of the nerve, including the cylinder axis, become disorganized, and disappear. Ultimately there is cicatricial shrinking, proliferation of connective tissue, and formation of oil-globules and amyloid bodies; that is, sclerosis and atrophy. The nerve is then changed into a cord of connective tissue, which is intimately connected with the neighbouring parts.

The inflammatory stage of acute neuritis lasts, according to my observations, from four to six weeks.

Neuritis may also be chronic, when there is less tendency to supuration and softening, and more primary sclerosis. Proliferation of the connective tissue is then the most prominent symptom, and Virchow has therefore called this form *interstitial proliferating neuritis*. The nerve appears

thickened and hardened, it has lost its brilliancy and is more cloudy, and there is only moderate hyperæmia. Wasting of the nerve-structures is then much slower, and caused more by pressure than by active inflammation. Again, there are cases where not only the connective tissue, but also the nerve-structure becomes hypertrophied. This process is designated as *hyperplastic parenchymatous neuritis*, and may lead to the formation of neuroma. Where the inflammation is not uniform, but more disseminated, affecting some parts and sparing others, the nerve assumes a spindle-like or nodulated appearance, and we then speak of *neuritis nodosa*. Sometimes there is a tendency for the inflammation to spread to a considerable distance beyond the point originally affected, both upwards and downwards; this is called *ascending* and *descending neuritis*. The former of these may ultimately reach a nervous centre, and then give rise to symptoms of much greater gravity than are ever caused by peripheral neuritis.

Where the inflammation is not severe, it does not always proceed to destruction of the contents of the nerve-tubes, or at least only to partial destruction. Regeneration of destroyed nerve-fibres may then take place, and is generally protracted for three months or even longer. This regeneration seems more easily effected in nerves which have only the function of common sensation and motion, and less easily in those which belong to the special senses. Thus I have seen it occur where the fifth nerve was affected even in a severe degree, and it is common in inflammation of the portio dura; while when the olfactory, auditory, or optic nerve have suffered in this manner, there is very much less chance of regeneration. Perineuritis is, of course, other things being equal, much less grave than neuritis, as the inflammation is in this disease more confined to the sheaths of the nerves, and does not implicate the cylinder axis.

The causes of neuritis may be local or general. All the various kinds of injury may give rise to it; cold is likewise a fruitful source. Certain systemic affections, such as diphtheria, smallpox, typhoid fever, pneumonia, rheumatic fever, lead to it. Syphilis causes neuritis, not so much primarily as by spreading of inflammation from neighbouring structures, more particularly the periosteum and bones, the membranes of the brain and spinal cord, etc. In the same way non-syphilitic inflammation or irritation of contiguous parts may give rise to neuritis. In *lepra anæsthetica* there are evidences of chronic perineuritis; and progressive locomotor ataxy is very frequently ushered in by neuritis of one or several of the cranial nerves.

I. *Olfactory Neuritis*.—The first case I wish to relate is one of acute idiopathic neuritis of the olfactory nerves, which occurred in a patient who is now under my care at the hospital, suffering from progressive locomotor ataxy.

C. S., a banker's clerk, aged 48, married and father of two children, had been in tolerably good health until about eight years ago, when, appa-

rently without any particular cause, he suddenly began to feel numbness in his feet, and lost the proper perception of the hardness of the ground. It seemed to him as if he was treading on India-rubber balls, or bales of cotton. About the same time he was startled by perceiving a strong smell of phosphorus, which overpowered all other accidental smells, and never left him at all for about six weeks. At the end of that period he noticed that he had entirely lost the sense of smell for odoriferous substances of any description. The smell of phosphorus had then given way to a persistent and not unpleasant kind of scent sensation, which he compared to that of civet very much softened down. This sensation continued for several years, but is now likewise gone; and there is at present a total absence of any olfactory sensibility. I tested the patient with assafoetida, ether, valerian, camphor, millefleurs, opoponax, and a variety of other strongly-smelling substances, either pleasant or disagreeable, none of which, however, caused the slightest effect upon his nose. He did perceive ammonia, which caused lachrymation and a choking sensation, just as in healthy persons, and also the vapors of strong acetic acid, and snuff, which caused sneezing. All these last-named substances, however, act on the nerves of common sensation, *i. e.*, the nasal twigs of the ophthalmic branch of the fifth nerve, and of the sphenopalatine ganglion.

The perception of flavours in eating and drinking was likewise almost entirely gone. It is a well-known fact that the gustatory nerve only responds to four different kinds of sapid substances, *viz.*, the saline, the acid, the bitter, and the sweet; and that flavours are recognized by the olfactory, not by the gustatory nerve. In accordance with this, I found that, when the patient's eyes were bandaged, so that he could not see what he was eating or drinking, he was unable to distinguish between stewed onions, apples, and turnips; although he could tell roast beef from roast mutton. He did not perceive the flavour of port wine or claret, but felt the former hotter than the latter, saying it was gin or brandy, while claret appeared to him like water. These sensations were evidently owing to impressions made on the lingual and palatine branches of the fifth nerve, and partook of common sensation rather than of special sense. It is a singular fact that, until experimented upon in this manner, the patient was not aware that he had lost the perception of flavours, but thought that he tasted everything quite as well as previous to having lost his smell; vision and memory evidently supplying, in this instance, the lost sense.

It is not necessary for my present purpose to enter into further details of this case. Suffice it to say that all the usual symptoms of ataxy, with regard to motion, sensation, and reflex action in the upper and lower extremities, as well as the condition of the bladder, rectum, and sexual organs, were present, and that the patient offers one of the most perfect types of sclerosis of the posterior columns of the spinal cord that can well be imagined.

*Remarks.*—In considering the pathology of this singular and instructive case, several questions force themselves on our notice: 1st. Was the loss of smell owing to an affection of the nerve, or of the accessory mechanism of smell? Anosmia, or loss of smell, may arise from either of the two. Thus we find it coming on through acute or chronic inflammation and thickening of the mucous membrane of the nose, more particularly from ozæna of syphilitic or strumous origin, from polypus, from adhesion of the soft palate to the posterior wall of the pharynx, which prevents the air

from passing through the upper or olfactory channel of the nose, etc. Again, we find smell impaired in facial paralysis from lesions of the portio dura, owing to loss of power in the compressor and dilator naris muscles. Both these muscles are of importance to olfaction, each serving for a particular mode of smelling at a substance. When we smell by taking a long forcible inspiration through the nose, while keeping the mouth closed, the nostrils become dilated in order to admit as much of the air charged with odoriferous substances as possible. In facial palsy this active dilatation of the nostril is impossible on the side of the lesion, so that smell will be impaired. In sniffing, which is really more effectual than one long inspiration, the compressor naris muscle comes into play. The air is then drawn in by a rapid succession of short and shallow efforts, during which the nostrils contract; the object of this being to close the lower respiratory channel and to allow all the air to pass through the upper olfactory channel. Lateral compression of the nose, however, is impossible where the compressor naris is paralyzed, so that the patient affected with facial palsy cannot sniff. A final reason why smell suffers in that disease is that the tensor tarsi, or Horner's muscle, is paralyzed. This small muscle, which is really a portion of the orbicularis oculi, draws the openings of the lachrymal ducts backwards, so that they may absorb the tears; and where it is put out of action, the tears are apt to run down the cheek instead of entering the nasal cavity, thus rendering the latter unnaturally dry, and therefore not well suited for the perception of smells. In all such cases smell may be impaired or lost, and yet the olfactory nerves and their centre in the brain be quite healthy; but in the present case the whole accessory mechanism of smell was in perfect order. The conclusion is therefore inevitable that the nervous arrangement had suffered at some point of its course between the nose and the brain.

The second question, therefore, which we have to consider, is whether the nerve-affection, which led to the loss of smell in the present instance, was a peripheral or a central one? Was it owing to some disease of the first pair of cranial nerves, or of the olfactory centre in the brain?

The centre of smell in the brain is believed to be situated near the island of Reil and the fissure of Sylvius, and in close proximity to the third left frontal or Broca's convolution, which is known to be the seat of intelligent language. Thus we find anosmia occasionally associated with aphasia and right hemiplegia, from softening of, or hemorrhage into, these structures. In such cases, however, the loss of smell is unilateral, and confined to the side of the lesion, which, in aphasia, is always the left side of the brain. We have therefore right hemiplegia and left anosmia. This apparent discrepancy is satisfactorily accounted for by the circumstance that there is no decussation of the olfactory paths in the anterior commissure which joins the two temporo-sphenoidal lobes of the brain, and smell, therefore, is appreciated on the same side on which it is per-

ceived. Experimental physiology has gone a step further in localizing the seat of the centre of smell even more exactly. Dr. Ferrier<sup>1</sup> finds this centre to be situated in the tip of the temporo-sphenoidal lobe or the subiculum cornu ammonis, which appears likewise to contain the centre for the perception of taste. Faradization of this part in monkeys, cats, dogs, and rabbits is followed by a peculiar torsion of the lips, and partial closure of the nostrils on the same side, *i. e.*, a sniff. Similar signs are produced by the direct application to the nostrils of powerful or disagreeable odours; and they are unquestionably the outward expressions of the excitation of subjective olfactory sensation of an intense character. Again, while stimulation of the subiculum causes olfactory perceptions, destruction of this part appears to cause loss of smell. Thus, for instance, it was destroyed in the left side of the brain, and a piece of apple was then offered to the animal, which took it, smelt it, and began to eat. The right nostril was then securely plugged with cotton-wool, and a piece of apple was once more offered. The animal again took it, but hesitated before eating, raised it repeatedly to the nostril and endeavoured to smell it, but apparently without success. An additional fact tending to show that the subiculum is the centre of smell is, that its structure is particularly developed in animals endowed with a very keen sense of smell, such as the dog, cat, and rabbit; and in them the anatomical connection of the olfactory tract with the subiculum is evident to the naked eye. In the monkey and man, where smell is not so keen, this connection is not so patent, yet thoroughly established by microscopical investigations.

Was therefore disease of the subiculum the cause of the anosmia in the present instance? To this I feel compelled to give a negative reply. We have seen that there is no decussation of olfactory paths in the anterior commissure, and that in central softening or hemorrhage the loss of smell is confined to one side. In the present case, however, the affection was bilateral; and moreover the sense of taste was perfectly normal. Surely, if there had been a lesion extensive enough to destroy both subicula, other symptoms, and more particularly loss of taste, would have been present. In their absence it seems to me permitted to assume that the lesion was a peripheral one, and occurred most probably where the olfactory bulbs lie closely together at the base of the brain, on the cribriform plate of the ethmoid bone.

The third point which I wish to discuss in connection with this case is the pathological nature of the affection. In considering this we cannot derive any assistance from post-mortem records of such or similar cases. It is true that sclerosis and atrophy of cranial nerves have been discovered in cases of ataxy which have proved fatal at an advanced stage of the complaint, but this does not give us any clue to the question whether the original lesion was inflammatory or one of simple disintegration, since both lead

<sup>1</sup> The Functions of the Brain, London, 1876, p. 183.

to sclerosis. Nor are the indications given by the ophthalmoscope in the amblyopia and amaurosis of ataxy altogether decisive, as it is not yet decided whether the lesion of the optic nerve in these cases is one of simple atrophy or of neuritis, which has led to atrophy. We are, therefore, obliged to look to the clinical symptoms of the case as our guide in this matter. There was at first a stage of sensory hyperæsthesia, which, after having lasted for six weeks, merged into complete anæsthesia of both olfactory nerves. This corresponds closely to what I have observed in neuritis of the fifth nerve, where there is likewise a stage of hyperæsthesia as evidenced by severe pain in the parts supplied by that nerve, and lasting for five or six weeks, after which complete anæsthesia and motor paralysis of the muscles supplied by the small root of the nerve has set in.

What is the meaning of the singular symptom of the patient perceiving the smell of phosphorus during the whole first period of the disease? I believe I am in a position to affirm that the olfactory nerve responds to stimulation other than by special odoriferous substances, by perception of the smell of phosphorus. It is well known that the constant voltaic current has a peculiar action on the nerves of special sense, which answer to its passage by certain well-marked sensations. Thus, galvanization of the optic nerve causes flashes of light, of the gustatory nerve a coppery taste in the mouth, of the auditory nerve a ringing or hissing noise in the ear. It is easy to demonstrate these facts, because the nerves I have just mentioned are very sensitive to the influence of the voltaic current, and therefore respond to a moderate power; while the olfactory will only give an answer when a very high power is used. A powerful voltaic current, however, when applied to the nose or any other part of the face, causes such disagreeable sensations of pain, giddiness, sickness, fainting, together with dazzling flashes of light and loud noises in the head, that experimenters in general have been unwilling to bear the inconvenience of the procedure or unable to analyze all the various sensations perceived at the time. The fact, therefore that the olfactory nerve does respond to the voltaic current by the perception of a phosphorous smell was not established until some years ago, when I demonstrated it in a patient who suffered from bilateral anæsthesia of the fifth pair of cerebral nerves. In this case a high voltaic power could be borne without inconvenience, because the patient was insensible to a moderate power. This patient was in perfect health except as far as the affection of the fifth nerve was concerned. His smell was keen; and, when the current was directed to the mucous membrane of the nose, which was insensible to ordinary stimulation, the patient invariably, and without having been questioned about it, said: "I smell phosphorus;" just as he mentioned that he saw flashes of light when the current was directed to the eyes. It is fair to assume that irritation of the olfactory nerve by hyperæmia and inflammation will cause a smell of phosphorus, just such as I have shown to follow voltaic irritation of the nerve, and just as in

retinitis flashes of light are perceived by the patient. All these circumstances taken together appear to me to warrant the conclusion at which I have arrived, that the case just related was one of acute olfactory neuritis, ushered in by hyperæsthesia, and marked in its later stage by anæsthesia of this special sense.

II. *Auditory Neuritis*.—The series of symptoms generally known as Menière's disease, appears to me to be owing to a considerable variety of anatomical lesions, and the term which has been given it in order to mark the merit of the illustrious French aurist who first drew attention to this class of cases, is therefore somewhat of a misnomer, as it does not designate a pathological entity. It is true that we possess at present only a few and meagre post-mortem records of such cases; yet the clinical symptoms are sufficiently striking to enable us to decide that they cannot all be owing to one and the same morbid process, and that the only connecting link between them is that their seat is in the membranous labyrinth. I think it would be best to confine the term "Menière's disease" to apoplexy of, or, more properly speaking, hemorrhage into, the labyrinth, as most of the cases described by Menière belonged to that class, and the only case in which he obtained an autopsy was also one of them. This was the case of a young woman who took cold at the period of menstruation, while riding on the top of an omnibus, and was suddenly seized with deafness, persistent vertigo, and vomiting. She died on the fifth day, and it was found that the centres of the nervous system were perfectly healthy, but that the semicircular canals on both sides were filled with a clot of blood, replacing the endolymph. This clot extended in a minor degree into the vestibule, but did not spread as far as the cochlea. Similar cases, but in which the cause was injury to the bone, causing hemorrhage and subsequent inflammation, have been recorded by Politzer and Voltolini. In one of them the injury was a blow on the temple, in the other a fall on the back of the head. In other cases the symptoms have come on without any apparent cause, and it is not improbable that in these the hemorrhage may have been owing to rupture of miliary aneurisms of the labyrinthine arterioles, and therefore be analogous to the ordinary form of cerebral hemorrhage. Such hemorrhage, however produced, causes an increase of the intra-auricular pressure, which is quite sufficient to account for such symptoms as deafness, tinnitus, unsteady posture, so that the patients are unable to stand or walk firmly, and fall down or are only prevented from falling by the bystanders; together with fainting, nausea, and in some cases insensibility.

There are, however, unquestionably, other pathological processes giving rise to similar symptoms as those just described. One of them I believe to be simple hyperæmia of the labyrinthine vessels, which I suspect in cases where the symptoms are sudden in their onset, not very severe, and transitory in their appearance. Sometimes the attack is entirely over in

a quarter of an hour, without leaving any traces ; and in such cases it is impossible to assume the existence of hemorrhage. Another and more important lesion I believe to be inflammation, which may be idiopathic, *i. e.*, occurring without any apparent cause, or symptomatic, *i. e.*, coming on in the course of severe systemic affections, more particularly pyæmia, the eruptive fevers, erysipelas, typhoid and puerperal fever, constitutional syphilis, etc. Again inflammation may spread contiguously to the labyrinth from other parts, such as the middle ear, when this is affected by acute catarrh and purulent inflammation ; and the membranes of the brain, in sporadic or epidemic cerebro-spinal meningitis. It is also worthy of notice that somewhat sudden deafness occurs in connection with infantile eclampsia ; and it appears highly probable that in such cases the real cause of the convulsive seizures as well as of the deafness, is irritation or inflammation of the labyrinth, and that the fits are caused by the extreme liability of infants to convulsive attacks from whatever cause, whether central or eccentric. Inflammation of the labyrinthine expansion of the auditory nerve I believe to be more common than is generally thought, and it has no doubt often been confounded with congestion or inflammation of the brain, and even been put down as an attack of severe dyspepsia and congestion of the liver. The chief distinction in the clinical symptoms of hemorrhage and inflammation is that the symptoms are not so severe and sudden in their onset in the latter, that they continue for a more considerable time, and become gradually more developed.

I will now relate the details of a case of what I believe to have been neuritis of the labyrinthine expansion of the auditory nerve, which occurred in a patient who was admitted into the hospital under my care, in January, 1876, suffering from progressive locomotor ataxy.

H. W., aged 32, married, father of three children, and a butcher by trade ; had been in good health until the commencement of 1875, when he began to feel poorly, and suffered from a troublesome form of indigestion, with nausea and loss of appetite. In May of the same year he suddenly began to squint and see things double, evidently from paralysis of one of the ocular muscles, although it would be impossible to determine at present which one of them was affected. These latter symptoms lasted only for a few days, and then left him ; but shortly afterwards he was affected with vertigo and a roaring noise in the head. There was also a feeling of sickness, but no vomiting. Within a few days the tinnitus increased considerably, and appeared to him like thunder, or as if there were explosions of gunpowder in his head ; at other times it resembled ringing of bells and screaming of whistles. There was at no time any loss of consciousness. This severe form of tinnitus lasted for rather more than a month, during which time the hearing of the patient, which before then had been perfectly good, was *gradually* much diminished, and at the end of the period mentioned, he found himself completely deaf. By this time the vertigo had left him, but on going about he noticed that he did not walk as well as before, more particularly in the dark, and was apt to stumble, especially on turning round ; and he felt the peculiar sensation



as if walking on cotton or bladders. Pain of a character peculiar to ataxy began to shoot through the lower extremities, more especially in the night, and on exposure to wet or cold. The ataxy increased rapidly, in spite of medical treatment, so that he became completely helpless; and when he entered the hospital, in January, 1876, he had already reached the third stage of the disease; in which not only the co-ordination of movements, but also muscular power suffers.

The examination of the patient proved unusually troublesome, as he was stone-deaf, and all questions had therefore to be written down for him on a slate, which he always carried about with himself. He was found to be utterly insensible to the shrillest and loudest noise, such as that of a cab-whistle blown just behind him; as well as to the sounds of musical instruments. He could not hear a watch tick when it was applied to the external ears or the cranial bones around; nor did he perceive the sound of a tuning fork applied to the vertex, and to the teeth. On applying the constant voltaic current to the ears, a distinct sound was perceived on making with the cathode and breaking with the anode. This sound the patient likened to a "blowing" or "ringing" noise, and it appeared to continue for some seconds after the current had commenced and ceased to act. This was over and above the habitual tinnitus, which never left the patient, and which was now of a moderate kind, resembling the flowing of water. The patient spoke intelligibly, and although he could not hear himself speak, he had no deficient or altered intonation of the voice.

The physiognomical expression was peculiar. His features appeared in perfect repose and unimpressionable, except when a question in writing was put to him. Having noticed a similarly statuesque expression in anæsthesia of the fifth nerve, from loss of cutaneous and muscular sensibility, I carefully tested the sensibility all over the face, but found it perfectly normal; and the total absence of physiognomical expression was therefore in this case owing to the patient being as it were shut out from the world, and his being indifferent to what went on around him.

I will here remark at once, that some time later, I had the advantage of Mr. Dalby's opinion on the state of the patient's ears. He confirmed my diagnosis of the nervous origin of the deafness. He found the external and middle ear, including the Eustachian tube and the tympanum, perfectly healthy. The conduction of sound was good, but the perception of it faulty; and he therefore thought the deafness due to change in the nervous structures, either in the labyrinth or intra-cranial.

The patient had not inherited any tendency to nervous affections, such as paralysis, insanity, or neuralgia. He had always been a steady, hard-working man, not given to alcoholic or venereal excess. He had never had syphilis or gonorrhœa. He never smoked. He had however in his trade, as a butcher, been obliged to go about a great deal in all kinds of weather, and in the small hours of the morning; and had lately had much anxiety about money matters.

There were no symptoms indicating cerebral disease; the intellect, memory, and speech being quite normal; and all the cerebral nerves, with only the exception of the auditory, were in full functional activity.

The spine was not tender to pressure or percussion, nor was there any spontaneous pain in it; and the pain in the limbs was less marked than it had been some time ago. There was incomplete cutaneous anæsthesia from the waist downwards to the feet, and also incomplete muscular anæsthesia. Tickling the soles produced no reflex movements, and pinching

the gastrocnemius and rectus femoris produced hardly any sensation. The muscles were flabby and somewhat wasted, but responded freely to the voltaic and faradic currents. The patient could not walk at all, except when supported by two persons, and even then he had the greatest difficulty in stepping out, the peculiar jerking gait of ataxy being plainly discernible. The helplessness was so great that it verged on paralysis. He could only stand when supported by two sticks, and when he closed his eyes he reeled like a drunken man. Yet he could when lying down or sitting on a chair move his legs and feet more freely than a patient can do who is suffering from myelitis or a high degree of spinal congestion.

The sexual power had been gradually lost during the last six months, and the bladder and rectum likewise participated in the disease. There was great difficulty in passing water, the patient having to strain for fifteen or twenty minutes before he succeeded in voiding a few ounces of urine. Occasionally there was incontinence. The urine was habitually neutral, and contained a large excess of urea and phosphates, but no albumen or sugar. The bowels were confined, and when purgatives were administered they often acted so rapidly that the feces were voided before the patient had time to reach the commode.

The upper extremities were unaffected, with the exception of a slight feeling of numbness in the third and little finger of the left hand. The heart and lungs were healthy. The appetite, however, was very bad, and digestion much impaired; the tongue was furred. There was tenderness in the right hypochondrium, and increased dulness in the region of the liver. The patient was considerably emaciated, and had a sallow and dyspeptic complexion. He was ordered nitrate of silver, hypophosphite of soda, and podophyllin. For two months no change for the better took place; on the contrary, the helplessness increased, and there was more frequently than before incontinence of the bladder and bowels.

Towards the end of March the patient was suddenly taken with vertigo, followed by coma. There were no convulsions. The complexion became of a deeper sallow, and after a time dark brown; the tongue had a dirty brown coat; there was involuntary discharge of the excretions. The pupils were very small. The right hypochondrium was very tender, the pulse 120, the temperature  $99.5^{\circ}$ . In three hours the coma was less severe, and he was then given five grains of Plummer's pill, followed by five grains of carbonate of ammonia every four hours in mixture. On the next day the coma was not profound; the morning temperature was  $100.2^{\circ}$ , pulse 110; the evening temperature  $101.5^{\circ}$ , pulse 120. The next day the insensibility had again lessened; the patient could be roused by talking loud to him; the morning temperature was  $99.6^{\circ}$ , the evening  $101.4^{\circ}$ . On the day after that the improvement was more decided; the expression brighter, the complexion less dark, consciousness had returned; the evening temperature was only  $99.2^{\circ}$ . On the fifth day the patient eat with a good appetite, and retained the feces and urine for the first time. The temperature was  $99.2^{\circ}$ , the pulse 90. On sitting up he felt giddy.

From this time forward he rapidly improved, and a week afterwards he was again in the same condition as before this attack. The medicines he had previously taken were now discontinued, and the liquid extract of ergot prescribed in half-drachm doses three times a day. This had an excellent therapeutical influence, since under its use a steady improvement took place in all the spinal symptoms. The remedy was gradually pushed up to a drachm three times daily, and was only discontinued once for a

few weeks, after having been taken for three months, as the patient then complained of general malaise, with loss of appetite, and had a feeble pulse. The citrate of iron and quinia was then substituted for the ergot, with good results as far as those symptoms were concerned; but there was now no further improvement in the spinal disease, and the ergot was, therefore, resumed a few weeks afterwards in forty minim doses. It was altogether taken for eight months; and at the end of that time the patient had entirely recovered from all symptoms of ataxy; only the deafness and tinnitus continued exactly the same. He was discharged in February, 1877; being then able to walk easily three or four miles, and when seen twelve months later, had been able to attend to his business just as before the commencement of the affection, and had had no further attacks of vertigo or insensibility, or in fact any other ailment.

*Remarks.*—It is now well understood that the auditory nerve is not simply a nerve of special sense, but has a distinct relation to certain centres which regulate the equilibrium of the head and the body. These functions appear to be so divided that the cochlear branch of the portio mollis is the real nerve of hearing, while the vestibular branch of the same regulates equilibration. Section of the auditory nerve in the skull, before it has divided into its two branches, causes both deafness and loss of equilibrium. A frog whose auditory nerves have been cut, may still jump when irritated, but will not regain its proper position afterwards; it falls on its back or side, and rolls over and over without being able to steady itself. The same is seen when the semicircular canals in the membranous labyrinth are injured, while injury of the same in the osseous labyrinth produces no such effects. Pigeons, in whom Flourens destroyed these canals, heard as well as before, but showed loss of equilibrium, when the cochlea was injured. In opposition to this, Menière taught that disease of the semicircular canals alone would cause deafness as well as vertigo; but it appears now well established by the researches of Goltz, Vulpian, Crum Brown, and others, that these canals have nothing to do with hearing, but serve to maintain the normal attitude of the body. These exceedingly difficult and intricate experiments are somewhat facilitated by adopting Vulpian's plan, which consists of previously feeding the animals with madder, whereby the canals are stained bright red, and are, therefore, rendered distinct from the bones in which they are inclosed, and which have a much paler colour. Each of the three canals appears, according to the most recent observers, to have a different function. Thus, division of the superior canals causes the head to be rapidly moved forwards and backwards, and there is tendency to execute a somersault forwards, heels over head; similar phenomena being induced by lesion of the anterior portion of the middle lobe of the cerebellum. Lesion of the external or horizontal canals produces rapid oscillations of the head and eyes from one side to another, and tendency to spin round; phenomena corresponding to those after injury to the lateral lobes of the cerebellum. Finally, destruction of the posterior or inferior canals leads to rapid move-

ments of the head backwards and forwards, with tendency to execute a somersault backwards, head over heels ; and lesion of the posterior portion of the middle lobe of the cerebellum will cause corresponding signs. That there should be such correspondence is readily accounted for by the microscopical investigations of Lockhart Clarke and Meynert, who have shown that the auditory nerve is, through the restiform bodies, in direct communication with the cerebellum, which we look upon as the central organ of equilibration.

Integrity of the labyrinth is, therefore, shown to be necessary for the maintenance of equilibrium of the head and the body ; and labyrinthine impressions are shown to be more important towards securing that end than any visual or tactile impressions, which are also concerned in it. These impressions appear to be dependent upon variations of pressure in the endolymph which fills the membranous canals. Pressure or tension of this liquid excites the terminations of the nerves in the canals and their dilatations or ampullæ. In accordance with the law of gravity, the endolymph distends mostly those portions which lie deepest ; and the pressure naturally varies with the movements and position of the head, so that each position corresponds to a definite state of nervous stimulation. The perception and consciousness of this state by the brain contributes the sense of equilibrium, and thus serves to regulate the movements of the body. As soon, therefore, as any injury to the canals has taken place, the brain ceases to receive accurate information of the position of the head, and is rendered unable to calculate and direct its movements in a proper manner. This disturbance is temporary when lesion of the canals exists on one side only, but is rendered permanent when both sides are affected. Loss of one eye does not produce blindness ; and the organ of one side may by a certain amount of training become efficient to inform the brain of the position of the head and the body.

Dr. Ferrier<sup>1</sup> finds the auditory centre to be situated in the superior temporo-sphenoidal convolution of the hemispheres. When this part is faradized in the monkey, there is a sudden pricking up of the opposite ear, wide opening of the eyes, dilatation of the pupils, and turning the head and eyes to the opposite side—signs resembling the sudden start and look of surprise that are caused when a loud sound is made suddenly close to the animal's ears ; both being indications of subjective auditory sensations. Faradization of the corresponding part of the brain in other animals whose habits are such as to make their safety depend upon the acuteness of their hearing, as, for instance, the rabbit and the wild jackal, causes even more striking effects, viz., in addition to those already mentioned, a quick start or bound as if to escape from danger, which might be indicated by loud or unusual sounds. Destruction of this convolution on both sides causes com-

<sup>1</sup> Loc. cit., p. 171.

plete deafness; and unilateral destruction of it renders the animal deaf on the side of the lesion.

Taking into account these several facts, we cannot experience any difficulty in arriving at a definite conclusion concerning the precise seat of the pathological lesion in the case which I have just related. It was evidently not located in the superior temporo-sphenoidal convolution, which, although the centre of hearing, has nothing to do with the equilibration of the body; nor could we consider the case one of cerebellar disease, the cerebellum being only the central organ of equilibration, but having nothing to do with the sense of hearing. The lesion must therefore have been seated in the auditory nerve, which presides over both hearing and equilibration, and destructive lesions of which will cause deafness as well as vertigo.

At what part of the anatomical distribution of the portio mollis was, then, the disease located? Evidently not at its root in the medulla, because there it is contiguous with the sentient root of the fifth nerve, and there would therefore no doubt have been anæsthesia of the face together with deafness. A case of this latter kind has been described by Professor Moos, in the *American Archives of Ophthalmology and Otology*.<sup>1</sup> Nor was it likely that the nerve-trunk was affected, where it emerges from the lower borders of the pons Varolii. I believe this portion of the nerve to have been healthy, because there was galvanic response on applying the voltaic current to the ears; and such response appears to be absent in destruction of the nerve-trunk. We are therefore led to the conclusion that the disease affected the labyrinthine expansion of the nerve, comprising the branch for the cochlea as well as for the vestibule.

The last point we have to consider is the nature of the pathological lesion in the labyrinth. This I believe to have been an acute inflammation, as there was a period extending over rather more than a month in which there were evident signs of special hyperæsthesia of the labyrinthine expansion of the nerve, which were followed by special and permanent anæsthesia. These symptoms correspond very closely to those which I have observed in acute olfactory and trifacial neuritis. The bad form of indigestion, with nausea, loss of appetite and giddiness, with which the illness commenced in the first instance, was probably owing to hyperæmia of the nerve. This increased suddenly, perhaps in consequence of some particularly severe exposure to the inclemencies of the weather which the patient's occupation necessitated, to inflammation, which lasted the usual term of acute neuritis, viz., from four to five weeks. The *gradual* loss of hearing during the period just mentioned speaks against hemorrhage in the labyrinth, in which deafness is more suddenly developed. The cord-affection which followed the attack of auditory neuritis, was likewise of a more markedly inflammatory character

<sup>1</sup> Vol. ii. p. 199.

than is usual in ataxy, as the symptoms became developed with far greater rapidity than is seen in the large majority of cases. The intercurrent attack of illness, which the patient had at the end of March, while in the hospital, was in my opinion owing to an attack of hemorrhage into the labyrinth. This attack commenced with sudden loss of consciousness, accompanied with some rise in the temperature, and left no further traces. The hearing having already been completely destroyed, no further damage could be done in that quarter.

III. *Perineuritis of the Portio Dura*.—One of the commonest affections of the cranial nerves is paralysis of the portio dura, more especially that form of it which is caused by the sudden influence of cold, and the more prominent symptoms of which are so well known that I need not describe them here. There are however several points connected with this affection on which still much obscurity prevails, and to which I will briefly refer in the hope of contributing somewhat to their elucidation. I will however confine myself in this place to a consideration of that form of facial palsy which I consider to be owing to rheumatic perineuritis of the nerve, without going into other forms of the complaint which are produced by injury, such as wounds, surgical operations about the face, application of forceps during delivery, or by pressure from neighbouring parts, such as abscess, swollen glands, tumour, periostitis, and paralysis from central lesions.

Although post-mortem examinations of cases of rheumatic perineuritis of the portio dura are as yet entirely wanting, yet there can be no doubt that this palsy is really owing to an inflammatory swelling of the perineurium of the nerve, with more or less considerable effusion of lymph. This is shown by the mode of its onset, which is generally sudden, after some unusual exposure to cold; while in some cases it is only established a day or two after the cause has acted. In the commencement there may be pain about the face, headache, twitches in the affected muscles, and tinnitus aurium; but as the portio dura is almost exclusively a motor nerve, there is naturally much less pain than occurs in neuritis of purely sentient or mixed nerves. The principal symptom is therefore the palsy, which is more or less severe and extensive according to the intensity of the cause which produces it, the condition of the patient at the time he becomes subject to the affection, and more especially according to the anatomical seat of the lesion.

Broadly speaking, we may divide all these cases into two large classes, viz., those where the inflammation occurs outside, and those where it occurs inside, the Fallopian aqueduct. In external perineuritis which affects the nerve immediately upon having emerged from the stylo-mastoid foramen, the pressure of the inflammatory swelling upon the contents of the nerve-tubes is not very great, as the nerve is there surrounded by soft parts, and therefore not so apt to be injured by squeezing; and in conso-

nance with this we find that facial palsy from external neuritis generally gets well in two or three weeks. The most prominent symptoms of this variety of the affection are palsy of all the facial muscles of one side, and loss of reflex excitability in them on irritating the conjunctiva, the eyes, or the skin of the face. The electric response of the muscles, both to faradization and galvanization is normal, and there is an absence of all symptoms implicating the senses of taste and hearing, and the soft palate.

That the seat of this external perineuritis is not in the peripheral branches of the nerve, or the pes anserinus, but in its trunk shortly after it has left the skull, is plainly shown not only by the paralysis affecting *all* the muscles of the face, but also by there being no affection of sensibility. If the seat of the inflammation were more peripheral, some facial muscles would no doubt be spared, and sensation in the face would suffer, from the intimate connection which exists between the branches of the facial and the fifth nerve. A final proof for what I have just advanced is, that in some few patients of this class paralysis of the small muscles which move the ear, has been observed. These muscles are supplied by the posterior auricular nerve, which is the first branch given off by the portio dura after its exit from the stylo-mastoid foramen, and which also gives a twig to the posterior belly of the occipito-frontalis muscle. Most people indeed are unable to move their ears, but some few can, and in some of them inability to move one ear has been observed under these circumstances.

The second large class of cases of facial palsy is that which is owing to *internal perineuritis* affecting the nerve at some point during its transit through the Fallopian canal. In such cases the cause and degree of the inflammation may be exactly the same as in external perineuritis, yet the results are more serious, for the nerve is there no longer surrounded by soft parts, but inclosed in rigid walls. The same amount of swelling will therefore give rise to a much more severe compression of the contents of the nerve-tubes, and thus cause more degeneration and atrophy in the same. The prognosis of internal perineuritis is therefore much less favourable than that of the external variety of the disease; and it is an interesting fact that by a careful electric exploration of the affected nerve and muscles we are enabled, within the first week or two, to determine with a great degree of accuracy whether the patient is likely to recover quickly, or only within three or six months. In internal perineuritis where there is more squeezing, we discover, generally within eight or ten days from the commencement of the affection, and sometimes even sooner, that peculiar alteration in the voltaic and faradic excitability of the nerve and muscles which I have called the *wasting-test*, and to the importance of which in the diagnosis and prognosis of infantile paralysis I recently directed professional attention.

The distinctive feature of the wasting-test is, that the induced or faradic current loses all influence upon the paralyzed nerve and muscles,

so that on comparing the two sides of the face in this particular, faradization of the portio dura and all the individual muscles of the face will cause these to move on the *healthy* side, but remains ineffectual on the *paralyzed* side. Again, the constant voltaic current loses in a similar manner its influence upon the *nerve*, but acquires increased action over the individual *muscles* which are paralyzed. It is therefore seen that a constant current which is too feeble to produce an effect on the *healthy* muscles causes the *paralyzed* ones to move very readily. This fact was first pointed out by Baierlacher. At the same time the character of the voltaic contraction is altered. It does not occur with that lightning-like rapidity which it assumes in the healthy muscle, but is sluggish, inert, tardy, and recalls to one's mind those muscular contractions which one sees in physiological laboratories in frogs, whose nerves have been paralyzed by woorara or coniine.

These phenomena are only present where there is muscular wasting owing to nerve-lesions, so that the term "wasting-test" appears to be an appropriate one to designate them. The absence of the wasting-test is characteristic for external, and the presence of it for internal, perineuritis; the reason for this being that in external inflammation there is less pressure on the nerve, and consequently no muscular atrophy, while in internal inflammation the nerve is thoroughly squeezed, and thereby loses its nutritive or trophic influence upon the muscles supplied by it. In the former case, therefore, the patient generally gets well within two or three weeks, while recovery will in the latter be protracted over from three to six months, and even more; or the nerve may not recover at all, but the paralysis may, in its later stages, become complicated with muscular rigidity, twitches, and atrophy, which imparts a most peculiar expression to the countenance. Such consequences are not simply owing to disuse of the muscles, for they do not occur in facial paralysis from cerebral origin, even when this has lasted much longer, but are due to the withdrawal of nutritive power from nerve-lesion.

Internal perineuritis of the portio dura may be subdivided into several forms, according to the exact spot in the Fallopian aqueduct where it occurs; and in no other disease can we trace the anatomical distribution of the inflammation, merely from the clinical symptoms, in a more minute manner than in the one to which I am now drawing your attention. The Fallopian aqueduct may, for this purpose, be divided into three different sections, the first of which reaches from the stylo-mastoid foramen to a point just before the origin of the chorda tympani; the second embraces the chorda and the stapedian nerve; and the third corresponds to the ganglion geniculum, where the petrosal nerves take their rise. The nerve, however, may also be subject to inflammation at the base of the brain.

a. When the inflammation takes place in the first section of the Fallopian canal, below the origin of the chorda, we have the same symptoms as



in external perineuritis, viz., facial palsy and loss of reflex excitability; but in addition to this, the phenomena of the wasting-test in the paralyzed muscles. Erb has drawn attention to certain hybrid forms of the disease, in which the wasting-test is somewhat blurred and indistinct, there being no actual loss, but only diminution of the faradic excitability of the nerve and muscles, which latter show increased voltaic response. This indicates that the pressure on the nerve is not very great, and that tolerably rapid recovery may be expected. Such cases probably correspond anatomically either to a severe form of external, or to a mild variety of internal perineuritis in the first portion of the Fallopian canal.

b. If the *second* intra-Fallopian section of the nerve be inflamed, we find, besides the foregoing symptoms, a peculiar modification of the sense of taste, which has to be ascribed to the chorda tympani being involved in the inflammation. The patient then experiences an acid, or metallic, or bitter, or simply a disagreeable taste, in the corresponding half of the tongue; and on testing the anterior portion of that organ with salt, bitter, sweet, and acid substances, it is found that they are not perceived there. The back part of the tongue, which is supplied by the glosso-pharyngeal nerve, and the opposite side of the organ, the nerves of which are unaffected, continue as keenly sensitive to sapid substances as previously, so that the patient before the examination is often not aware that the sense of taste is impaired. The chorda tympani proceeds from the portio dura to the lingual branch of the fifth nerve, and ends in the submaxillary ganglion. It is, no doubt, owing to this latter circumstance that, coincidentally with the loss of taste, there may be great dryness in the corresponding side of the mouth, owing to arrested secretion of saliva in the submaxillary gland. The experiments of Nawrocky have rendered it probable that the chorda also influences the secretion of saliva in the sublingual gland, and that the parotid receives secretory fibres from the superficial minor petrosal nerve, so that the dryness of the mouth is amply accounted for. Eulenburg has suggested that the dryness of the mouth may be owing to the mouth being always a little open, in consequence of the paralysis of the orbicularis oris, whereby the evaporation of the saliva is accelerated; but this theory seems to me unsatisfactory, as dryness of the mouth does not occur in facial palsy from cerebral or medullary origin, where, nevertheless, the mouth is somewhat open; and I hold, therefore, to the view that the symptom is owing to paralysis of the chorda tympani.

Another interesting symptom of neuritis in the second intra-Fallopian section of the portio dura is *hyperacusis* (or *oxykeoia*), that is, hyperæsthesia of the sense of hearing, which has to be attributed to paralysis of the stapedian nerve. This nervelet, which leaves the portio dura a little above the chorda tympani, supplies the stapedius or levator tympani muscle. The pressure in the tympanum and the tension of the drum of the ear are regulated by two different muscles which receive their nervous

supply from two different sources, viz., the levator, which is animated by the stapedian from the portio dura, and the tensor tympani, which receives a branch from the otic ganglion of the fifth nerve. This latter muscle does therefore not participate in the paralysis, but attains increased action by removal of the influence of its antagonist. The drum of the ear, therefore, acquires a higher degree of tension, the pressure in the tympanum is intensified, and excessive keenness in the appreciation of all musical sounds is the result. These sounds appear also generally somewhat lower than they really are, besides which there is a considerable degree of tinnitus aurium and an uncomfortable sensation of pressure in the internal ear. Whenever therefore we meet with hyperacusis in affection of the portio dura, we are justified in assuming that the seat of the disease is above the origin of the stapedian nerve. This peculiar affection of hearing is entirely independent of any disease of the auditory nerve itself, and of internal purulent otitis, which are such frequent complications of facial palsy.

c. Where the perineuritis affects the third intra-Fallopian section of the portio dura, at its bend, and implicates the ganglion geniculum, near the internal end of the aqueduct, another important symptom makes its appearance. At this point the portio dura sends off the large superficial petrosal or Vidian nerve, which proceeds to the spheno-palatine ganglion, and through it to the soft palate, where it supplies the levator palati muscle. Vidian paralysis therefore causes deficient action of the velum palati, which droops on the paralyzed side, and does not respond well to reflex or electrical stimulation. In some cases it has been found deviated to the other side; and there may be difficulty of deglutition, a nasal twang in the voice, and regurgitation of liquids through the corresponding nostril. The uvula may also be found deflected either to the paralyzed or to the healthy side. We can readily understand why it should be pulled to the healthy side, from preponderance of the healthy muscle; but why should it be found deflected to the paralyzed side? Dr. Sanders has suggested that this is owing to increased action of the pharyngo-palatinus muscle, whose fibres terminate at the base of the uvula, and which is the antagonist of the levator palati. This muscle would therefore act more powerfully on the paralyzed than on the healthy side, receiving its nervous supply from a different source. The matter is, however, rendered very complicated by the circumstance that the uvula is not by any means straight in many healthy persons, and conclusions from an oblique position of it should therefore be drawn with considerable caution.

Nearly at the same level with the large superficial petrosal, the portio dura sends off the small superficial petrosal to the otic ganglion, and the external superficial petrosal to the sympathetic plexus on the middle meningeal artery; but symptoms owing to paralysis of these nerves have not yet been observed. Perineuritis in this third section of the Fallopian

aqueduct is rare, and we therefore find that the symptoms just described are absent in the majority of cases.

A common complication of facial palsy is deafness, which is owing to simultaneous affection of the portio mollis. Both nerves may be affected at the base of the brain, or there may be purulent internal otitis, in which case there is generally perforation of the membrana tympani and purulent discharge from the external ear. If the portio dura becomes inflamed at the base of the brain, where it emerges from the posterior border of the side of the pons Varolii and the lateral tract of the medulla oblongata, there are almost invariably affections of other cerebral nerves, more especially the portio mollis. This is seen in syphilitic periostitis, exostoses, and gummatous tumours, and is generally more owing to squeezing from without than to neuritis or perineuritis. Facial palsy is also observed in affections of the nucleus of the nerve, in the medulla, pons, the cerebral peduncles and hemispheres, but is then generally owing not to inflammation, but to softening, hemorrhage, tumours, etc., and does not therefore fall into the sphere of the present paper.

The *prognosis* of perineuritis is generally much more favourable than that of neuritis, because in the former, although there is pressure on the nerve-tubes, yet the cylinder axis generally escapes destruction, while in the latter the whole of the contents of the nerve, including its central core, is destroyed. Thus we find that almost all cases of facial palsy ultimately recover, while olfactory and auditory neuritis are rarely influenced by any treatment. It is true that these latter cases are generally only specially treated after the inflammation has subsided, and when the nerve-tubes are left in a state of hopeless decay.

If a case of acute neuritis is recognized in the beginning, it should be treated according to general principles, *i. e.*, by leeches, blisters, and the application of ice as near as possible to the seat of the disease. This should be combined with the internal administration of calomel and opium, in doses of one grain each, several times a day. After the acute stage has subsided, a stimulating treatment may be resorted to, more particularly by the application of the constant voltaic current to the suffering nerve. Iodide of potassium may also be given, although its usefulness in such cases appears very doubtful. For perineuritis the same rules hold good as for neuritis, and are fortunately more effective in practice.

## ARTICLE IV.

SYMPATHETIC NEURORETINITIS, WITH REMARKS ON SYMPATHETIC OPHTHALMIA. By GEORGE C. HARLAN, M.D., Surgeon to Wills [Ophthalmic] Hospital, Philadelphia.

A VERY large number of cases of sympathetic ophthalmia have been recorded and much has been written upon the subject, but the following cases may perhaps be of sufficient interest to report because the disease assumed an unusual form, or one, at least, which has received comparatively little attention.

CASE I.—K. W., a healthy girl of eighteen, from the country, was admitted to the Wills Hospital Feb. 11th. She had been blind in the right eye for many years, and for the past week had been much alarmed by a rapidly increasing dimness of vision in the left. The right eye had been injured by a blow from a stick in early childhood, and since then it had been quite blind, frequently irritable and occasionally painful. No other history could be obtained. The other eye had never given any trouble before the present occasion. There was disorganization with phthisis of the right eye, apparently the result of panophthalmitis. There was no pain at the time of the examination, but the ball was tender on pressure. The left eye had presented no other symptom than dimness of vision, its external appearance was perfectly natural, and there was no tenderness on pressure. Ophthalmoscopic examination showed the disk swollen and its margins obscure, the veins engorged, and a number of the whitish spots about the macula characteristic of albuminuric retinitis. The probability of Bright's disease suggested itself at once to every one who examined the fundus, but the urine was found to be perfectly normal. Vision =  $\frac{1}{125}$ .

The disorganized bulb was enucleated on the 13th. All other treatment was purposely avoided until the effect of the operation could be observed, and on the 15th vision was found to have increased to  $\frac{1}{75}$ . The artificial leech was afterwards applied to the temple on two occasions and Potass. Iod. and Hydr. Bichl. were administered. On the 17th V. =  $\frac{1}{60}$ . She continued to improve steadily, and at the time of her discharge, April 3d, V. =  $\frac{1}{25}$ , or nearly up to the normal standard. An ophthalmoscopic examination made at this time showed a marked change in the fundus. The disk was nearly normal, the swelling all gone, and the margins only slightly indistinct in places. No œdema of retina; vessels normal; still a number of whitish spots scattered about the macula.

The enucleated ball was set aside for examination, but was unfortunately lost. For the notes of the second case I am indebted to Dr. S. D. Risley.

CASE II.—“J. B., æt. 39. One month ago, while using hammer and iron chisel, received a fragment of steel from the hammer head in the left eye, which pierced the sclera about 3''' from the inner corneo-scleral junction. Eye remained painful for two days afterwards, but is at present painless. T. = — 2. Red and tender to the touch; no perception of light. Eye-ground cannot be illuminated with mirror. Oblique light shows yellow red reflex from posterior surface of lens.

"O. D. unduly sensitive to light—has photopsia—fronto-occipital pain. No ciliary redness, but slight ciliary tenderness and slightly diminished range of accommodation.  $V. = \frac{20}{xxx}$ ? with difficulty, miscalling some

letters. Ophthalmoscope shows media clear, retina hazy and striated, nerve too capillary, and margins veiled. Enucleation of injured eye advised, to which he consented. The ball was subsequently divided through its vertical meridian from before backwards. Vitreous, straw-coloured and fluid; a fragment of metal  $\frac{1}{4}$ " in length,  $\frac{1}{8}$ " broad, ragged in outline, was found lying  $\frac{1}{4}$ " below entrance wound in the ciliary body, surrounded by a mass of lymph.

"O. D. remained sensitive to light for a week or more, and the neuroretinal appearances slowly disappeared. He was discharged from further observation about six weeks after enucleation, and I lost sight of him."

This form of sympathetic ophthalmia appears to be comparatively very rare. Dr. Adolf Arlt, in a paper read before the International Ophthalmological Congress of 1876, says that it is not even mentioned in Mooren's classical work, and that he had been able to find only four cases recorded in literature. To these he added three, not before reported, from the practice of Drs. Knapp and Gruening. In only one of these seven cases was the neuroretinitis uncomplicated; in the others there was also iridochoroiditis.

I am indebted to Dr. W. F. Norris for reference to two other cases of sympathetic neuroretinitis. Pflueger<sup>1</sup> reports a case in which this disease occurred in the sound eye a month after the other had been destroyed by gonorrhœal ophthalmia. It was cured by enucleation of the blind eye. The other is by Hirschberg,<sup>2</sup> who speaks of a case of sympathetic neuroretinitis not improved by enucleation, but afterwards cured by inunction treatment. An interesting point in Pflueger's case is the fact that the sympathetic disease followed destruction of the first eye by suppurative inflammation. Several similar cases are recorded.

This gives a total of eleven cases of sympathetic neuroretinitis, in nine of which enucleation was performed. The operation was followed by cure in five cases, and by decided improvement in two, and was done in the other two without success. One of the latter, however, afterwards recovered under treatment, which probably might not have happened if the offending organ had been allowed to remain.

Examination of the enucleated balls is reported in four cases, and disease of the optic nerve was found in each. The nerve behind the ball, however, does not seem to have been examined. Such an examination might decide whether the disease has been communicated to the other eye by direct extension through the nerve, or its sheath ("perineuritis"), as some authorities have held. The section of the nerve was made as far back as possible in the case reported above, with this end in view: it is to

<sup>1</sup> Jahresbericht über Ophthalmologie, 1877, p. 286.

<sup>2</sup> Id. 1876, p. 373.

be hoped that this intention may be carried out with better luck, or less carelessness, by others.

In two of the cases collected by Dr. Arlt, the resemblance of the ophthalmoscopic appearances to those found in albuminuric neuroretinitis is noted. The large proportion of three out of eleven cases presenting this appearance is interesting. A similar condition has been found in several reported cases of neuritis from intracranial tumour. In such a case, recently under observation at the Wills Hospital, the urine was found to be perfectly normal. Though the ophthalmoscopic picture was perhaps not in any of these cases what could be called typical of albuminuric neuroretinitis, it was sufficient in all to excite strong suspicion of Bright's disease of the kidneys. As the urine is frequently albuminous in cases of intracranial tumour, it has been a question whether the retinal changes in such cases might not be the result of secondary or incidental kidney disease, but this consideration may be excluded in sympathetic neuroretinitis.

The channel by which sympathetic ophthalmia is communicated from one eye to the other is still an unsettled point. As is usual in cases of doubtful pathology, the aid of the sympathetic nerve has been invoked by some authorities, but the ciliary nerves are almost universally considered the means by which the disease is propagated, as it usually manifests itself in the whole or a part of the uveal tract—the iris, ciliary body, and choroid. Though this view has no anatomical basis, as morbid changes in these nerves have been found too rarely to have any significance, still, here, as in other parts of the body, nerves may be the medium of communicating diseased action without presenting any changes in their own structure: the “reflex inflammation” of Brown-Sequard and others. Mackenzie thought that the optic nerves were the chief medium through which sympathetic ophthalmia was excited, and that the inflammation always commenced in the retina and only secondarily involved the other textures of the eye. Though this view was long ago entirely abandoned, there is reason to suppose that disease may, occasionally at least, be propagated in this manner. Dr. Arlt, in the statistics of nearly one hundred and fifty recorded cases in which eyes enucleated for the relief of sympathetic ophthalmia had been examined, found that the optic nerve and retina had been diseased in about 80 per cent., and thinks that sympathetic ophthalmia may not unfrequently originate in neuroretinitis, and be transmitted by the optic nerve. This is an interesting pathological question which deserves further elucidation. In the first case just reported and the other referred to in which the neuroretinitis of the eyes secondarily affected existed alone, uncomplicated with inflammation of any other part of the organ, it is not easy to understand how the ciliary nerves could be held responsible.

Other facts have been observed which tend to confirm the possibility of

neuritis being transmitted in this way. Dr. Colman,<sup>1</sup> under the head of "Neuritis Migrans," reports three cases of secondary optic neuritis occurring in a sound eye after the extirpation of a diseased one, and believes that the inflammation was propagated through the connective tissue space between the outer and inner sheaths ("lymph space"), through the chiasm, to the sound eye.

Though "neuritis descendens" may be considered a fixed fact, and optic neuritis has frequently resulted from intracranial causes, I believe there is no positive proof of an ascending neuritis extending from the eye to the brain; but cases are on record which make such an occurrence probable. Cases have been reported of meningitis following enucleation, ending sometimes in recovery<sup>2</sup> and sometimes in death. At least six of the latter are recorded,<sup>3</sup> and Graefe, on account of this danger, advised against enucleation in the acute stage of suppurative panophthalmitis. Pagenstecher, who reported one of the fatal cases, made a careful examination of the optic nerves and found them normal. He thinks the meningitis was set up by the purulent choroiditis and not by the operation. For fourteen days before the operation there had been sleeplessness, loss of appetite, and intense headache, and sympathetic ophthalmia had existed for five days. The patient was much relieved at first, but had a violent chill twenty-four hours after the operation, and seventy-four hours after the operation died of meningitis. In another of the cases, by Just, the symptoms of meningitis did not appear until eight days after the operation. No post-mortem. In still another case, Horner<sup>4</sup> found meningitis which could not in any way be traced to the enucleated eye. No detailed account of the other three cases could be found.

Six cases is a very small proportion of the enormous number of enucleations performed in the last twenty or thirty years, in many of which it may be taken for granted that the eyes were in a state of suppurative inflammation, and, unless we suppose that there has been a fatal result in many unreported cases, the accidents have been scarcely numerous enough to disturb the prevalent opinion that the operation is almost free from danger. Cohn<sup>5</sup> reports three cases in which he performed enucleation during the acute stage of suppurative panophthalmitis without unpleasant results, and seems inclined to throw the weight of his authority against the caution of Graefe. Arlt<sup>6</sup> says: "Should, however, panophthalmitis be already established, the operation of enucleation cannot be considered free from danger."

<sup>1</sup> London Med. Record, Oct. 15, 1877, p. 421, and Berliner Klin. Wochenschrift, 1877, No. 12.

<sup>2</sup> R. L. O. H. R., Dec. 1877, p. 252.

<sup>3</sup> Annales d'Oculistique, Nov. 1873, p. 253, and Jan. 1875, p. 15; Klinische Monatsblätter für Augenheilkunde, 1872.

<sup>4</sup> Schussverletzungen des Auges, H. Cohn, p. 12.

<sup>5</sup> Ibid.

<sup>6</sup> Injuries of the Eye, Am. ed., p. 156.

Enucleation gives the patient so much more certain and immediate relief from present suffering and future inconvenience and danger than any partial operation, that it is a matter of great importance to decide whether Graefe was right in forbidding its performance in panophthalmitis. Any case of death that may occur under these circumstances should be carefully reported, and an earnest effort made to establish or disprove the connection between the operation and the meningitis. While it is a significant fact that the reported deaths have all been in cases of suppurative panophthalmitis, it is to be remembered that these are just the cases in which, supposing the disease of the brain to originate in the eye, it is most possible to conceive that meningitis might have been excited without the operation. I have occasionally extirpated balls in a state of suppurative inflammation, and have sometimes had occasion to regret not having taken the risk. Two cases recently under treatment at the Wills Hospital may serve as illustrations. One, that of a man whose eye had been injured three weeks before by a piece of steel, which was supposed to be still in the ball. He suffered agonizing pain, which was only partially relieved by large doses of morphia, and was unable to leave his bed. The ball was enucleated and found not to contain a foreign body, but there were abscess of the vitreous, irido-choroiditis, and beautifully marked neuritis. All symptoms ceased at once, and the patient was returned to his work in a few days. In the other case suppurative panophthalmitis was excited by a rather desperate attempt to let a little light into a disorganized and staphylomatous but "quiet" eye by iridectomy. The front of the ball was abscised, but for several days there were great chemosis, enormous swelling and tension of the lids, considerable hemorrhage from the choroid, and pain almost as severe as before the operation, and a suppurating cavity remains which is likely to require treatment for weeks.

It is now so well established that enucleation is the only safe remedy for sympathetic ophthalmia that it is scarcely necessary to refer to it in that connection, but a glance at the history of the operation may be not without interest.

Mackenzie is usually credited with being the first to call attention to sympathetic ophthalmia and to recommend the extirpation of an injured eye to save its fellow, but Hirschberg,<sup>1</sup> in an "Historical Notice on Sympathetic Ophthalmia," makes a claim of priority for Von Ammon. He says: "Mackenzie, Beer's great pupil, undoubtedly deserves great merit for his investigations on sympathetic ophthalmia, and it is not my intention to detract from this merit. But I think it ought not to be forgotten that as early as 1835 Von Ammon, whose name is not even mentioned in the historical introduction to Mooren's excellent monograph, wrote the following in his prize essay on iritis: 'When an eye is wounded, and traumatic iritis ensues, the disease not unfrequently attacks the sound eye.

<sup>1</sup> Archives of Ophthalmology and Otology, vol. v. p. 393.



I have noted this morbid sympathy in more than one case.'” Then follows an account of two cases of traumatic sympathetic ophthalmia, but there is no suggestion of operative treatment.

As will be presently shown, Wardrop, in 1834, was not only familiar with the fact of sympathetic ophthalmia, but plainly suggested a treatment practically much like that now in use, and the following extract from the first edition of Lawrence on *Diseases of the Eye*, published in 1833, shows that this disease was not at that time unknown to English surgeons :—

“The influence of one eye upon the other is not confined to cases of disease. When an eye has been lost by accident, the other often becomes diseased sooner or later, without any imprudence or any external influence that would be injurious under ordinary circumstances. This kind of occurrence is so common that it is necessary to warn those who have lost an eye of their danger, and to point out the necessary precautions for avoiding it. For this affection of the sound eye, if it is not noticed and properly treated in the early stage, often destroys sight. Its most common form is slow inflammation, which may affect the iris, the retina, or internal tunics generally.”

Mackenzie in his first edition, published in 1830, refers briefly to the subject in the following words: “We sometimes meet with severe sympathetic inflammation in the eye which has not received the injury.”

The operation advised by Mackenzie was free incision of the ball. This would perhaps be equally efficient in a considerable proportion of the cases in which extirpation is now resorted to, but Mackenzie himself is not known ever to have performed it. The first hint of this practice seems really to have been given by the London farriers. It was known to them that a disease frequently occurred in horses which affected first one eye and then the other, and usually ended in loss of sight, but that if the eye first affected suppurated and “sank in the orbit,” the disease did not attack the other. They, therefore, adopted the practice of destroying the eye first affected by the rather rude procedure of thrusting a nail into the ball or applying lime beneath the lids. Wardrop improved upon the farriers' treatment by evacuating the lens and vitreous through an incision of the cornea, and suggested that “in some diseases of the human eye, when the disease makes a similar progress, first affecting one eye and then the other with complete blindness, the practice so successful in animals might, by judicious discrimination, be beneficially adopted.”<sup>1</sup> To Wardrop then (next to the horse doctors) clearly belongs the credit of this suggestion.

The object of the farriers' operation seems to have been to excite suppurative inflammation, and it is interesting to note, in this connection, that Von Graefe, some years afterwards, observed this preventive effect of suppuration and adopted the practice of exciting it by passing a seton through the injured eyeball. During the life of the great Berlin oculist, and for some time afterwards, this was a recognized plan of treatment; but as some

<sup>1</sup> Morbid Anatomy of the Human Eye, 2d ed., 1834.

cases have since been reported of sympathetic ophthalmia following supuration of the globe, it would not now be good practice.

Since the above was written the following reply to a request for information about the disease in horses referred to by Wardrop, has been received from Mr. James Law, Professor of Veterinary Surgery in Cornell University :—

“The disease is a constitutional and hereditary one, recurring at intervals of a month, more or less, and especially in young horses, excited by stabling, breaking, and, above all, teething. In a predisposed subject it may be excited by any health-disturbing cause. It often subsides permanently when teething is past, and when the severe changes that tell so on the young horse can no longer affect him. This sometimes occurs after the loss of an eye, in other cases of two, but the loss of the eyes has less to do with the matter than the changed conditions of life and the access of maturity.”

It appears from this that the treatment borrowed by Mr. Wardrop from the farriers is not now in use by veterinary surgeons, but whether the practice in this particular class of cases was rational or not, it furnished the hint that first suggested the operative treatment of sympathetic ophthalmia. The chapter in which the suggestion occurs is headed, “Of the Sympathies of the Eyes,” and even the traumatic form of sympathetic irritation is referred to.

There can be no doubt that Mackenzie was the first to discuss the subject fully, and to urge its great importance upon the profession, and that to him more than to any other is due the credit of giving to sympathetic ophthalmia a recognized place in the list of eye diseases, and of establishing the rational and successful treatment that is now universally adopted. Barton, of Manchester, was in the habit of slitting the cornea freely, and applying a poultice in cases where there was a foreign body in the eye, and Mackenzie closed his classical chapter on Sympathetic Ophthalmia with the following sentence: “When there is a suspicion that there is a foreign body lodged within the eye, there can be no question that the Barton operation ought to be adopted; but even in other cases why should we hesitate to lay open an eye in which vision is extinguished if the operation affords a reasonable hope of our being thereby able to save the other?”

This hesitation was, however, manifested for a long time afterwards even by many excellent practitioners, and the operation had to make its way against a very strong and, as it seems to us now, a very unreasonable prejudice. Among the inmates of institutions for the blind are still to be found many victims to the misplaced affection for sightless and unsightly eyeballs which in too many instances has been encouraged by medical men. This prejudice is now fortunately a thing of the past, and the enucleation of a useless eye, that is manifestly exciting disease in a sound one, is never opposed by a competent medical man, and is rarely declined by an intelligent patient. But this cannot yet be said of what has been called “preventive enucleation”—the enucleation of a ball that is doing no evident mischief at the time, but which, in all human probability, will give trouble

sooner or later—the removal of an organ that can never be useful, must always be dangerous, and is almost certain to be injurious.

When the subject of sympathetic ophthalmia was brought before the ophthalmological section of the International Medical Congress at Geneva in 1877, Warlomont, of Brussels, in view of the opposition still too often met with, even from the profession, wished to arm the specialist with the official decision of the recognized authorities in ophthalmic surgery, and, at his request, the Section confined itself to the discussion of “preventive enucleation.” A free discussion resulted in the adoption of the following conclusions:—

I. “Sympathetic accidents resulting from traumatism of the eye are primary or secondary. The former appear a few days after the accident; the others at some future time—in months or years—after the patient has recovered from the immediate effects of the wound.

II. “When an eye has been destroyed by a traumatic cause, and all hope of restoring a useful degree of vision is lost, an immense service is rendered the patient by relieving him of it at once. He is thus spared the immediate results of the injury, ophthalmitis, etc., and returned in a few days to his work, and, at the same time, is preserved from the danger of consecutive accidents. When there is reason to believe that the wounded globe contains a foreign body, the indication for enucleation is still more urgent.

III. “When an eye, lost by a local cause, traumatic or other, or the stump that represents it, is the seat of a continuous or intermittent irritation, or of an acute or chronic inflammation, or contains a foreign body, or a cretaceous lens, enucleation is indicated as a preventive measure, even in the absence of any manifestation of sympathetic irritation.

IV. “The enucleation of a lost eye is indicated, even if it is completely painless, if the second eye becomes the seat of symptoms attributable to sympathy.”

This verdict of the highest ophthalmological court is no doubt a just one, but it is still a question whether there are not some cases in which an eye, blind from traumatic cause, though it may not be acquitted, may have the sentence commuted to rigid surveillance. If the eye preserves its natural appearance, as occasionally happens, and the other is entirely free from suspicion of irritation, a patient who can afford the expense and loss of time of a prolonged treatment, and who can be depended upon to report instantly at the first note of warning, may be indulged in the natural prejudice in favour of the original organ as compared to the most perfect substitute: but he cannot be too strongly impressed with the risk he is taking, and with the fact that ceaseless vigilance is the price of safety. An additional consideration presents itself in the case of children, and may sometimes induce us to attempt to save an eye that in an adult had better be extirpated at once. Not only will contraction of the lids and arrested development of the orbit render the wearing of a full-sized artificial eye in after life impossible, but the development of the brow, and particularly of the malar bone, is also arrested, and a very decided deformity of the side of the face results. Of course this is a small matter in comparison with blindness, but it is worth considering in the decision of a doubtful case.

## ARTICLE V.

EXCISION OF THE EPIGLOTTIS. By WM. PORTER, A.M., M.D., Fellow of the American Laryngological Association, Physician to the Throat and Lung Department, St. Luke's Hospital, St. Louis.

THE literature in reference to malformations and injuries of the epiglottis is meagre. A few instances on record, and others which are now presented, strengthen the conclusion that in cases where this cartilage has been destroyed, no important function has been in consequence greatly hindered. Following this is the deduction that where the epiglottis is primarily diseased beyond the hope of repair, it, or part of it, may be removed. The main objection to this procedure must be, not the difficulty or immediate danger of the operation, but the possibility of serious if not fatal results as a sequence to interference with deglutition. The answer to this is—

1st. A diseased and ulcerated epiglottis is of itself oftentimes an obstacle to deglutition.

2d. In certain affections of the epiglottis, especially when of malignant nature, its destruction is inevitable, and involvement of the surrounding structures certain, if the process is not previously limited.

3d. Removal of the epiglottis does not necessarily, directly or indirectly, threaten either the life or the comfort of the patient.

If the last statement is sustained the indication is obvious, for the others cannot but be conceded. In the normal condition the epiglottis facilitates deglutition, especially of liquids, by dropping backwards and downwards, forming a dome to the larynx, which is at the instant raised to meet it. When solid or semi-solid food is to be passed into the œsophagus, the assistance of the tongue is required. Cases constantly occur in practice in which, on account of thickening or ulceration of the epiglottis, liquids cannot at first be taken because they are liable to enter the larynx, but by care and practice the deglutition of liquids is accomplished almost as readily and in the same way as of solid food. In other words, the base of the tongue may so cover the larynx as to compensate for the loss of the epiglottis, while the larynx is further secured by being closed by the appropriate muscles and folds. The epiglottis also acts to some extent as a sounding-board, reflecting the vocal sound wave to the pharynx, where it is in part articulated. When the epiglottis is destroyed the main objective evidence is that the vocal sounds, such "a" and "e," are less distinct; also the voice may be rough and harsh, if the edge of the cartilage remaining is irregular and jagged. In an interesting article in the *Journal of Physiology*, Sept. 1878, Dr. Walton attempts to prove that the epiglottis is not essential to deglutition, even of liquids, but that it is an important agent in the modification of the voice. The first part of this assertion is undoubtedly true.

So long ago as 1831, *The American Journal of the Medical Sciences* chronicled two cases of loss of the epiglottis, from the *Clinique Chirurgicale* of Baron Larrey :—

At the battle of Aboukir, the famous Murat received a musket ball, which entered the neck, wounded the base of the tongue, and cut off part of the epiglottis, which was immediately expectorated. The baron passed a tube into the œsophagus for the purpose of carrying food into the stomach. “This was necessary, as there was no proper valve to prevent the ingress of substances into the trachea. In eighteen days, however, the parts had so accommodated themselves to the loss of a part of the epiglottis, that this officer was able to swallow with little or no inconvenience.”

The other case is that of a soldier in Egypt, who in 1801 lost the whole of the epiglottis by a musket ball. By perseverance in the use of the elastic tube, “the life of the soldier was saved, and nature supplied the place of the epiglottis with a contrivance of her own.”

Another instance is mentioned in the same journal (Apr. 1869), in the practice of Dr. E. M. Corson, in which death from inanition, on account of painful deglutition, followed the loss of the epiglottis from tubercular ulceration. In this case there was extensive ulceration of the surrounding parts, and the reporter does well to say—not that deglutition was impossible, but that it was painful.

Eberth (*Virchow's Arch. xliii., Am. Jour. Med. Sci., Apr. 1870*) notes a case of congenital absence of the epiglottis, which was in a manner replaced by a small fold of mucous membrane; with this, two lateral folds united to close the glottis. There was little, if any, disturbance of function.

I am indebted to Dr. Jos. L. Bauer, of Vinita, I. T., for the history of a case from which is made this extract :—

An orphan girl, æt. 17, is under treatment (Jan. 1878) for throat disease of long standing. Her parents, she says, both died from a constitutional disease, and the direct evidences of inherited syphilis are conclusive. The upper incisors are notched and peg-shaped, the arch of the hard palate is abnormally high, the soft palate is destroyed, on the post-pharyngeal wall are gummy tumours, and the turbinated bones are necrosed. In the larynx, the vocal cords are thickened and partially ulcerated. The epiglottis is entirely gone, but deglutition is readily accomplished. The voice has a hissing character, and her words are indistinct.

To these examples I add two from my own case-book.

CASE I.—D. A., clerk, by birth English, æt. 19, well formed and intelligent, examined May 3, 1877, gave this history: In Jan. 1874, for the first time suffered from hoarseness and pain in the throat. Six months later the pain had almost disappeared, but his voice was husky, and he had some difficulty in swallowing. During the succeeding year he expectorated freely thick yellow matter, occasionally streaked with blood. At no time had there been excessive cough, but he lost flesh rapidly for some months. For almost a year, however, deglutition has been more easily accomplished, and his general condition is evidently much improved. The only marked objective evidence of organic lesion is the rough, guttural, and somewhat monotonous voice, and sometimes stridor. By aid of the laryngoscope the result of great destruction of tissue can be seen. The epiglottis is entirely gone, and a large cicatrix occupies the site of the right ary-epiglottic fold. The corresponding arytenoid cartilage is destroyed, and the right vocal cord, though seemingly intact, is unmovably fixed to the side of the larynx. When phonation is attempted, the left cord crosses the median line till it approximates the right side, and thus the intervening space is closed. The family history corroborates the diagnosis of inherited syphilis.

CASE II.—Mr. H., merchant, æt. 53, came for advice Jan. 18, 1878, on

account of long persistent hoarseness and some difficulty in swallowing. He had contracted syphilis eighteen years before, and three years prior to the above date he had great pain in his throat, difficulty in deglutition, and foul breath. These symptoms were more or less persistent for two years, but since then have to a great extent disappeared. On examination the vocal cords are seen to be slightly thickened, and about three-fourths of the epiglottis is destroyed. The edge of the lingual portion of the valve which remains is irregular, and at one point is a narrow projection which has partly resisted the ulceration on either side. A month after the notes of this case were taken, I removed the more prominent irregularities. Since then there has not been so much obstruction to deglutition, and, succeeding local and constitutional treatment, this patient's voice is almost normal, and his general health better.

As these histories confirm my belief that the loss of the epiglottis does not necessarily destroy any important function, I had but little hesitation in treating the following case as described :—

CASE III.—Mr. P., stock raiser, æt. 44, was first seen April 10, 1878. Five months before he noticed that he had some difficulty in swallowing, and more recently there has been some pain in the region of the larynx, with pain and persistent cough. There was no evidence of either inherited or acquired disease, nor evidence of complication of the thoracic organs. With the laryngoscope a large well-defined nodule was seen occupying fully three-fourths of the free edge of the epiglottis to the left of the median line and extending into the substance of the normal tissue about three lines. One-fourth of the surface of this nodule was ulcerated, the rest smooth, firm, and not greatly congested. There was nothing abnormal in the appearance of the larynx proper, except that the vocal cords were slightly congested. For several weeks both local and general treatment was used to induce absorption, but nothing was accomplished. The diseased mass, with quite one-half of the epiglottis, was then removed on a line from the upper right margin to the lower left side, just in front of its attachment. Prophylactic tracheotomy was at first considered, so as to guard against the danger of blood entering the larynx, but was thought unnecessary, as the patient had perfect control of his throat. Antero-posterior rectangular forceps with cutting edge was used, and the hemorrhage was quickly checked by passing a sponge covered with Monsel salt over the cut surface. Semi-solid food was ordered for the subsequent week, and the profuse granulations which appeared were touched from time to time with nitrate of silver. In this case artificial aid in deglutition was not required, for, on account of the length of time during which the epiglottis had been diseased, the patient had already learned to supply its loss. The margin healed in a fortnight. At no time after was deglutition more difficult than just previous to the operation, and six weeks later there was little if any functional disturbance. The growth under the microscope was found to be of a cartilaginous character, properly belonging to Virchow's class, *ecchondrose*. When magnified 350 times, cartilage cells could be seen in small groups surrounded by fibrous filaments. The neoplasm was directly connected with the epiglottidean cartilage. The ulceration extended through the mucous membrane, but there was no degeneration of the tumour substance.

The result of operation in this case, the knowledge of the cases before mentioned, and the report of Dr. Herman Beigel (*Boston Med. and Surg.*

*Journ.*, Aug. 13, 1868) of two cases in which the epiglottis was removed without loss of any function, are my arguments for this conclusion: If a benign growth of the epiglottis exist, or there is malignant disease which has not as yet implicated the surrounding parts, removal of the epiglottis, or such a part of it as is involved, is practicable and justifiable. .

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#### ARTICLE VI.

ENCYSTED TUMOURS OF THE EYELIDS AND VICINITY. By CHARLES STEDMAN BULL, A.M. M.D., Surgeon to the New York Eye Infirmary and to Charity Hospital, New York.

THESE tumours belong to the class of retention tumours, that is cysts which are formed by a particular secretion, the product or at least the result of the activity and metamorphosis of tissue. The most important feature in this class of growths is the collection of the secretion. In two classes of these retention tumours, both of which presuppose the existence of an open space, there may be a different mode of origin. In one the lining membrane of this space may secrete the contents in one and the same spot, as occurs sometimes in minute gland ducts. In the other class, the secretion is poured out by the membrane or gland, but is not excreted, owing to obstruction in one or more of the passages leading from the secreting surface; and this condition is also frequently met with in the excretory ducts of glands. In both of these classes of cysts, the development consists in a widening of the canal into a space or sack, and here there is great difficulty in deciding whether we have to do with a dilated excretory canal or tube, or with an entirely new formation. An examination into the histology and pathology of encysted tumours of the eyelids teaches us the impossibility of always determining their origin and mode of growth, for we never know, with any certainty, what histological combination we may meet with. We may find in the eyelids cysts of apparently analogous nature, which on examination will prove to have originated in different ways, and are hence of varying pathological importance. This it was that led to the doctrine propounded by Bichat, and adhered to for many years, that the cellular tissue was the natural place of origin of secretions or exudations of most varying nature, and that cysts were nothing more than the dilated or distended spaces in the connective tissue.

Another point which has perhaps led to mistakes in diagnosis of the mode of origin is the alteration which may and often does occur in the character of their contents. Cysts of the eyelids not uncommonly undergo a change in their contents. A secretion, which at first was solid or nearly so, may become gelatinous and even fluid, either from an actual change in the process of secretion, or from a breaking down of the mass already

secreted, either by retrograde metamorphosis or actual suppuration; so that in course of time the original character of the contents may be entirely lost. For example, the sebaceous or colloid contents of a cyst may become coloured from repeated hemorrhages, and also more fluid. Cysts in the eyelids, as elsewhere in the body, may be "barren" or proliferous, that is, the contents may consist of fluid or unorganized matter, or of organized material. Barren or simple cysts may be either serous, or bloody, or colloid. According to Paget these cysts may originate in three different ways. They may be formed by the enlargement and fusion of the spaces or areolæ in fibro-cellular, areolar, or other tissues; the secretion accumulates, the boundaries of the spaces are worn down and pressed together, and finally there is a perfect cyst, the walls of which continue to secrete. Secondly, some are formed by dilatation of natural ducts or canals, as the sebaceous or epidermal cysts resulting from enlarged hair-follicles. Thirdly they may be formed by the enormous growth of new-formed elementary structures, like cells and their nuclei.

The class of cysts known as sebaceous or epidermal are not uncommon in the eyelids. Many of them result from overgrown or distended hair-follicles, but some of them are certainly of autogenous origin. These sebaceous, or epidermal, or dermoid cysts form by far the larger number of encysted tumours occurring in the eyelids. When of any size, the cyst wall usually consists of well-developed fibro-cellular tissue, that is connective-tissue fibres and nuclei, arranged in one or more layers. The cyst-wall or membrane is generally firmly connected with the neighbouring tissues, so that the cyst is with difficulty removed. According to Rokitansky the large cysts of this kind have no epithelial lining, while Paget states that they are usually lined with tessellated epithelium. The cyst-wall may attain any degree of thickness, may become calcified in whole or in part, or may undergo fatty degeneration.

The simple serous cysts may occur in the eyelids, but are more common in and beneath the conjunctiva. Their origin is not always easy to determine and sometimes is very obscure. They are often congenital but are sometimes met with late in adult life. One class of these cysts is sub-conjunctival, and has been discussed in a short paper by the writer, published in the *American Journal of the Medical Sciences* for January, 1878. Hunter (*Pathol. Catalogue Museum Coll. Surg.*, vol. iv.) relates the case of a subconjunctival cyst, situated between the orbital margin and upper lid, which contained pure oil, and Schuh (*Ueber Pseudoplasmen*) reports two similar cases occurring in the same region.

The so-called "colloid" cysts are also met with in this region: that is, cysts with semi-solid, gelatinous contents, but they are far less frequent than the serous cysts.

These two last varieties of cysts are difficult to understand from a pathological standpoint. It is not possible to say whether the oil or the colloid



matter is secreted as such, or whether they are the results of a breaking down or degeneration of contents of a different nature. We know that diversity of contents may sometimes depend on difference of origin, but it is a general rule that cysts are apt to degenerate, and the larger a cyst grows, the less organized are its products. It may also be said that the longer a cyst has existed, the less organized are its contents, and hence in the case of the oily and colloid cysts, the probabilities are that their contents have undergone degeneration.

Dermoid proliferous cysts very often form in the subcutaneous tissue of almost any part of the body, and are usually congenital. They are not uncommon about the eyebrow, and according to Lebert (*Abhandlungen*), their inner surface is often perfectly cutaneous.

Paget regards them as very commonly hereditary, but this admits of some doubt.

The cutaneous character of the interior of these cysts I have never been fortunate enough to observe, perhaps, because I have seen but few in young children. In adult life, particularly if the cysts have existed for a long time, this cutaneous character certainly is not present, and it is impossible to say whether it ever existed. If it did, it underwent degeneration during the growth of the cyst. The presence of short hairs in the cyst is perhaps a proof of the presence of skin tissue at some earlier period of existence. Some modern authorities hold that these sebaceous or epidermal cysts which appear late in life are imperfect imitations of the same tumours met with in the fœtus and young child, and this may be the true explanation of the difference. It certainly seems a rational one.

The hair bulbs and sebaceous glands of the skin are very often the seat of tumours, which sometimes grow to an enormous size, and the relation of the hairs to the bulb and sheath will afford an explanation. The growing hair, in its passage from the bulb to its exit from the skin, is surrounded by a sheath, which at its narrowest part is perforated by the opening of the sebaceous gland. A slight swelling of the connective tissue beneath the epidermis, or a slight increase in the amount of secretion of the epidermal cells, is sufficient to clog the sheath and its opening. Then follows naturally the retention of the secretion and later the formation of a retention cyst. Rindfleisch gives a very clear presentation of the case. According to him, the hair bulb is much wider at the base than in the excreting duct or sheath, and hence the secretion of the wall of the follicle meets with an obstacle to its excretion in this very wall, and the fact that the cast-off cells of epidermis do not remain at the bottom is due to the continued growth of the hair, which carries them along in its progress toward the surface; or, as Rindfleisch expresses it, the hair sweeps out clean its own channel. It is easy to see that a very slight obstruction will effectually put a stop to this, while the process of secretion is still going on.

Now if we look at the eyelids, we will find a structure filled with hair bulbs and glands, and hence we should infer that these sebaceous tumors occur very frequently in this region; and this is so. The small hordeola or styes and the larger chalazia, which occur so often in the lids, are tumors of this character, with sebaceous contents, but no hairs. They are caused by a stoppage of the canal by an increased secretion, which thus becomes at once the cause and effect of the distension of the follicle. Some of these larger tumours were formerly called atheromata, and are almost always acquired. Here the upper lid seems to be the preferred site, and there may be several on the same lid. Their growth is sometimes very slow, sometimes rapid, and their contents vary with the duration of the process, from a sticky, adhesive mass to a cheesy or waxy consistence. They are said to occur more frequently in persons who are exposed to great changes of temperature and weather, such as sailors and lower class laborers. The tendency to multiplication in these tumours is very marked, and relapses are frequent.

Distinct from these are the hyaline cysts, which often develop on the skin of the lids, either with or without simultaneous conjunctival irritation. These are very small, not larger than a poppy-seed, and are usually accompanied by photophobia and more or less lachrymation. They seem to be collections of fluid beneath the epidermis or epithelium, for they are usually met with along the edge of the lid, where skin and mucous membrane meet. Their pathology is still an unknown field, for on being pricked they disappear, and do not form again.

True dermoid cysts of the lids may be regarded as generally congenital. They are said to be usually situated on the temporal side, near the eyebrow, and may contain a serous fluid, or a semi-solid atheromatous matter, and occasionally hairs, which grow from the inner wall of the cyst. They often lie in the lid entirely underneath the orbicularis, may penetrate to a considerable depth, so as to involve the entire thickness of the lid and reach the cavity of the orbit, and may be attached firmly to the periosteum. In such cases treatment demands extirpation by a free incision, the external wall of the cyst being carefully dissected out down to its deep attachments. If the cyst wall be punctured during the operation, the removal of the cyst is rendered extremely difficult, but must be persisted in until it is entirely completed; for if part of the cyst is left behind, obstinate suppuration may and generally does ensue, which delays for a long time the closure of the wound, and may induce serious secondary inflammation in the orbit.

Richet (*Recueil d'Ophthalmologie*, Jan. 1874) records an interesting case of dermoid tumour of the upper lid of a man, æt. 46. The growth had existed since early childhood, and was probably congenital. It was situated at the internal angle of the right upper lid, was as large as a hazel-nut, and lay between the eyebrow, root of the nose, and internal

canthus, reaching as far down as the internal canthal ligament, but no farther. The man had been treated twenty-two years before in the Lyons Hospital, where the tumour had been crushed, and compressive forceps employed to bring about adhesion of the walls of the cyst, but the tumour soon reappeared and grew again. The fact that the tumour did not extend below the canthal ligament, Richet regarded as a very important point in differentiating the growth from lachrymal and prelachrymal tumours. The growth was fluctuating or soft, and not lobulated. The overlying skin was covered by a network of enlarged veins, and so thinned that the yellow contents could be recognized. The skin was adherent to the cyst, and the cyst was adherent to the deep tissues and to the frontal bone. On attempting to introduce the finger between the tumour and the orbital arch, a depression was discovered, which proved that the tumour lay in a shallow cavity in the frontal bone, which had probably been hollowed out by long-continued pressure. It was not a lipoma, for fatty tumours are not so soft or doughy, and are usually lobulated. It was evidently not malignant, for it had existed since infancy, and yet had not involved the other structures in its vicinity. Hence Richet regarded it as a dermoid cyst, containing some of the elements of skin, such as hairs.

Dermoid cysts situated in this region are very apt to be imbedded in the bone, and this must be recollected in operating upon them. The prolongation which penetrates the frontal bone must be dissected out and removed entire; or if this is not practicable, some caustic agent, like zinc chloride, must be employed.

Ormsby (*Medical Press and Circular*, April 16, 1873) reports a somewhat similar case of an acquired tumour in a woman, æt. 58. This tumour began to grow four years before, making its appearance as a small swelling in the upper lid at the internal angle. It had reached the size of a hazel-nut, and had to be dissected out carefully down to its bony attachment.

As a contrast to these two cases may be cited a case reported by Kufferath (*Presse Méd. Belge*, No. 41, 1877). The cyst was in the lower lid, was as large as a pigeon's egg, and had formed within two years. It was easily shelled out through a simple incision, and proved to be an atheroma with thickened walls and granular, cheesy contents, containing cholesterine.

Another example of true dermoid cysts is reported by Little (*Trans. Dublin Path. Soc.*, Dec. 17, 1870), who removed a setigerous tumour as large as a walnut from the eyebrow of a young girl. The contents were of the usual cheesy material, composed of epithelial cells, fatty matter, and cholesterine, and in addition, numerous small and delicate hairs. On the inner surface of the cyst-wall were seen growing from genuine hair follicles several hairs of a similar character.

The uselessness of all other treatment except extirpation is shown in a

case reported by Planteau (*Bull. de la Soc. Anat.*, 1874). The case was a congenital cyst of the lower lid in a woman, æt. 23. It was as large as a hazel-nut, and filled with a yellowish gelatinous fluid. After puncture, injection of tincture of iodine, and drainage, on three different occasions, the cyst refilled each time, and finally had to be dissected out entire. The cavity then healed without any further trouble.

The cysts which contain hairs, either mingled with the contents or growing from the cyst-wall, are regarded as congenital, and Cramer's (*Casper's Wochenschrift*, 1845, No. 5) case is one of the earliest recorded with any accuracy. This tumour was removed from the right upper lid of a peasant, and was found to penetrate as far as the orbit, and was as large as a robin's egg. On being opened the tumour showed at least forty small hairs, some free, others attached to its inner surface, a serous fluid, and a fatty precipitate. This cyst dated from birth, but had grown somewhat rapidly during the last year.

These congenital dermoid or sebaceous cysts occasionally undergo calcareous degeneration. Sichel regards such a transformation as a great rarity, as may be seen by a reference to his article, entitled: "Considérations sur les kystes pierieux ou calcaires des sourcils." (*Annales d'Oculistique*, tome lvii.) They are of a bony or stony hardness, small in size, varying in diameter from 4 mm. to  $1\frac{1}{2}$  cm., irregularly oval and always flattened. They are movable beneath the skin, but the posterior surface is almost always adherent at one or more points. They are situated beneath the derma. Sichel removed a tumour of this nature from the eyebrow of a young lady, and a chemical and microscopical examination showed that the growth was composed of lime and magnesia, deposited in the irregular cells of an abundant nitrogenous organic substance.

Rizet also reports (*Annales d'Oculistique*, tome lvii., 1867) what he calls a bony cyst of the upper lid, in a man æt. 26, who was a private in an engineer regiment. For four years there had existed upon the left upper lid a very hard, movable tumour, of unknown origin. It was situated in the centre of the eyebrow, and was partly concealed by the orbital arch when the eye was open, but on closing the eye it became quite prominent. During the last few months it had grown so as to occasion some trouble in opening the lid. By an incision parallel to the eyebrow, and by careful dissection, a bilobed cyst, weighing 0.3 decigramme, was with some difficulty removed. It was found to be surrounded by a resisting membrane, and was divided into two pockets or sacks of nearly equal size. The contents proved to be carbonate of lime, and were very hard, giving forth almost a metallic sound when struck.

These sebaceous cysts are not always filled with sebaceous matter, as might be supposed, though the latter usually constitutes the greater part of their contents. When they are situated in the derma, and there can be no reasonable doubt of their having originated in a dilated hair bulb,

the cheesy mass is found by microscopical examination to be made up of many layers of epidermal or epithelial scales, mingled with a greater or less quantity of fat cells from the neighbouring sebaceous glands involved in the process.

But we occasionally meet with sebaceous cysts of a larger size, which from their situation are certainly autogenous, for they lie entirely beneath the skin, in the subcutaneous tissue of the part, and are cystoid new formations. All of such cysts that I have seen have been congenital, or at least appeared in infancy, have been of large size, and were all situated at the external angle of the eyebrow and lapped somewhat upon the temporal region. They appear to be of slow and steady accretion, growing with the general bodily growth, are painless, and apparently never undergo any inflammatory reaction. The pressure which these cysts exert upon the neighbouring parts, but especially upon the parts beneath, is sometimes very considerable. This may be due to the fact that the skin in this region is much thicker than in the eyelid, and perhaps resists the growth of the tumour better. Another reason may perhaps be the presence of a firm, unyielding base, the frontal bone, on which the growth rests, which does not exist for the cysts in the eyelid. It is certain that under the influence of this constant pressure, the bone atrophies or at least grows thinner, leaving a hollow in which the tumour lies.

Rouget and Lebert even cite cases in which an actual perforation of the underlying bone has been the result of this long-continued, steady pressure. These tumours have a very well-defined thick cyst-wall, and are usually very firmly adherent to the surrounding connective tissue, and especially so to the underlying periosteum. Their deep situation, underlying the skin and fibres of the orbicular muscle; their relations to the broad ligaments of the eyelids, which in any operation should be preserved uninjured so as to prevent extensive inflammation from starting in the cellular tissue of the orbit; their mobility, which is more apparent than real, and the deep adhesions which they contract; all contribute to render an operation for removal a somewhat delicate procedure. If the cyst is opened prematurely, the wall can no longer be removed entire except by a lengthy and tedious excision in strips. For such cases as these the fixation forceps of Duploupin (*Bull. et Mem. de la Soc. de Chir. de Paris*, April 5, 1878) might prove serviceable. The instrument consists of two delicate, sharp blades or branches, 7 or 8 centimetres long, slightly bent from before backwards, and mounted in a convenient handle. They diverge from the heel of the instrument towards the point, so that the angle of separation is three times larger than the angle of union of the blades. Their action is simple. Before incising the skin, engage the blades beneath the cyst, the convexity of the blades towards the orbital arch, and by pressure, bring the cyst forwards between the blades and towards their point of union, to a greater or less extent, according to its size,

until it is seen to be firmly fixed. Then incise the skin and fibres of the orbicular muscle overlying the tumour, if any such there be, and expose the cyst, which pressed forwards by the forceps, would probably be dissected out with comparative ease. The pressure of the blades of the instrument also prevents much hemorrhage from the divided vessels during the operation.

Leaving now the consideration of these sebaceous cysts for the moment, we will consider briefly a very rare form of growth which has been met with in the eyelid, which can scarcely be regarded as a cyst, for it has no distinct wall. Its mode of origin is very obscure and almost entirely conjectural. I have had no personal experience of this class of growths, and there are exceedingly few cases reported. They are glandular in nature, and the best description of one has been given by Mr. Nettleship (*R. L. Ophthalmic Hosp. Rep.* vii. 2). The growth was situated in the left upper lid of a young girl, æt. 11; was about as large as a raspberry, and had been growing for a year. It projected from both cutaneous and conjunctival surfaces of the lid, but though the conjunctiva was adherent to it, the skin was not. There was no undue vascularity of the overlying skin, but the inner surface of the lid was very much congested. It was not painful nor sensitive on pressure. On incising the tumour through the conjunctival surface, no tarsal tissue was recognized, but the growth was found to be solid and uniformly firm throughout, and its cut surface did not bleed. The tumour was then carefully dissected out and removed entire, together with the closely adherent conjunctiva. There was no capsule to the growth, but the deep part of the tumour, next the skin, was easily separated from the subjacent muscle. Its cut surface had a yellowish colour and finely granular structure, the individual granulations projecting slightly from the surface. Thin sections under the microscope showed that it was composed of very numerous gland follicles, with a considerable overgrowth of the connective tissue elements of gland structure. The follicles in many places were branched or furnished with secondary pouches. Some of the follicles became elongated and narrowed as if about to pass into ducts. The large size, uniformly firm, fleshy texture, absence of cyst wall, and relative abundance of hypertrophied connective tissue, make together a picture that is very different from the ordinary tarsal cyst. Its mode of origin is very obscure. From its glandular nature, it is certainly possible that the morbid process may have originated in one or more of the follicles of a Meibomian gland. These small glandular structures being more or less completely imbedded in the tarsus, the dense nature of the latter would tend to restrain the growth of any distended follicles of a gland to a certain extent, until its resisting power had been overcome by long continued pressure, ending in atrophy. The absence of all signs of the tarsus in the region of the tumour, unless we are to regard the hypertrophied connective tissue as the tarsus, could be naturally explained by

this mode of origin and course of the growth. Perforation of the tarsus is not an uncommon feature in tarsal cysts which start beneath the orbicular muscle. The tumor was, however, adenoid tissue, and apparently resembled some of the structures we meet with in the conjunctiva in cases of chronic granular conjunctivitis, where there is much thickening of the palpebral mucous membrane.

The following cases of encysted palpebral tumors have been under the personal care of the writer, and are interesting from a pathological standpoint:—

CASE I. *Large Tarsal Cyst with Fluid Contents.*—The patient was a blacksmith, æt. 39. About two years before I saw him, while working at his forge, he had received a somewhat severe blow upon the left eye from a small piece of iron, which his hammer in a glancing blow had struck from the bar upon the anvil. The piece struck the closed lids of the left eye near the internal canthus flatwise, for although the pain was severe and loss of sight instantaneous, there was no bleeding and the skin was not abraded. The lids swelled enormously, and when seen by a surgeon some days subsequently there was evidently a great deal of subcutaneous and subconjunctival extravasation of blood, from the man's own story. The swelling gradually subsided under the application of iced compresses, so that at the end of a week he could open the eye with comparative ease. The vision also began to return, and in a few weeks he had regained his sight completely. The injury had probably caused a hemorrhage into the anterior chamber, and perhaps into the vitreous, with paresis of accommodation from the force of the concussion. He resumed his work and noticed nothing wrong until about two months after the accident, when he became aware of a small lump or swelling at the inner corner of the upper lid, perfectly painless, about the size of a small pea, which grew slowly larger, and gradually became quite a deformity, and interfered somewhat with the action of the levator muscle of the lid.

When first I saw him the deformity was marked. At the inner angle of the left upper lid, occupying about a third of the transverse or long diameter of the lid, and reaching from the orbital margin to the line of the internal canthal ligament, was a swelling as large as a grape or cherry, projecting forward beyond the level of the bridge of the nose, and completely filling up the hollow at the side of the nose. It was somewhat movable, had apparently a broad base and rounded summit, and presented a distinct fluctuation. The skin over it was freely movable and not at all reddened. When the eyes were closed tightly, the tumour seemed to recede somewhat, to become again very prominent when the eye was opened widely. This fact, together with its distinct limitation below by the canthal ligament, convinced me that I had to do with a cystic tumour of the lid, and that it was situated beneath the orbicular muscle. The lid could be only partially everted, but there was no sign here, or at the inner angle of the orbit, of the external tumour. The limiting band below, the internal palpebral or canthal ligament, is a band of fibres which arise from the nasal process of the superior maxillary bone, runs across the upper part of the lachrymal sac, thence backwards and inwards towards the posterior lachrymal crest where they are inserted. It is plainly visible through the skin, and is firmly adherent to it and to the underlying tissue surrounding the lachrymal sac. It is thus seen that any collection of fluid in the tissues

of the upper lid is prevented from passing into the tissues below at this point by this firm band of ligamentous fibres, which anchor the lids to the bone, and also serve as an origin for the muscular fibres of the orbicularis. The tumour being to the inside and above the upper canaliculus, caused a constant epiphora by pressing upon this canal and obliterating its calibre. A small incision was made along the ciliary margin of the lid, between the tarsus and skin, just external to the lachrymal punctum, and a quantity of clear, yellowish fluid evacuated and collected for examination. The swelling collapsed at once, and on the second day all trace of it had disappeared, except a looseness in the folds of the skin. The fluid was alkaline, and contained some cholesterine crystals and some shrivelled red-blood corpuscles.

Some weeks later, when I thought the case had been cured, the man presented himself again with a swelling almost as large as before, and, supposing that I had to do with a true cyst, it was decided to remove it. An excision was made through the skin, parallel to the margin of the lid, and the fibres of the orbicular muscle were plainly seen overlying the tumour. These were gently shoved aside with the handle of the scalpel, and the delicate sub-muscular fascia exposed. On attempting to divide this and reach the cyst wall the tumour was punctured and the contents escaped. An examination showed that there was no cyst in the true sense of the word, but that the fluid was collected in a cavity formed out of the meshes of connective tissue of the lid, between the orbicular muscle and the tarsus. A few drops of strong iodine tincture were then injected, the lips of the wound carefully cleansed and left open for drainage. A small amount of suppuration followed, there was very little reaction, and the wound soon closed. The fluid evacuated resembled that examined at the first operation.

Now, what was the mode of origin of this fluid cyst without a cyst wall, to give it a name? At the time of the injury there had been great extravasation of blood in the lid and conjunctiva from numerous ruptured vessels. At this point in the lid, between muscle and tarsus, there may have been one of the larger vessels ruptured by the blow, and a clot collected in the meshes of connective tissue. The solid constituents of the clot probably underwent decomposition and were absorbed, but the clear yellow fluid must have been a later exudation from the vessels or lymphatics in the neighbourhood. The presence of the few blood corpuscles may perhaps point to the elucidation of the question. The recurrence of the fluid after its evacuation certainly points strongly to the presence of a secreting surface, but a careful examination showed that there was no distinct cyst wall present.

CASE II. Female child, æt. 2, badly nourished, and of strumous aspect. The child had been subject to frequent attacks of phlyctenular keratitis. The mother states that nothing unusual was observed on the child's face at birth, but that within the first month she noticed a small swelling on the lower lid, which was hard and immovable. This continued to increase in size slowly until the child was brought for treatment. When first seen the child was suffering from a bad attack of conjunctivitis and blepharoadenitis, and the margins of the lids were so swollen, indurated, and excoeriated that in all probability this condition of affairs had existed since early infancy. At the junction of the left lower lid with the tissues of the cheek, and at about its middle, was a hard, smooth, round tumour, with flattened base. It was about the size of a hazel-nut, was somewhat firmly imbedded in the subcutaneous tissues, but could be moved in every direc-



tion with some degree of freedom. The skin was freely movable over it, showing that there were no adhesions, and was not at all reddened. The child was somewhat emaciated, so that the limits of the tumour could be clearly made out. It did not seem to involve the lid except at the lower margin of the tarsus. The lid could be easily everted, and the tumour distinctly felt though there was no prominence in the region of the conjunctival cul-de-sac. It could be distinctly determined that there was no connection between the growth and the periosteum of the malar or superior maxillary bones.

It was decided to attempt the removal of the tumour, which was probably of a sebaceous character. The child was etherized, and a long incision made through the skin parallel to the edge of the lid. The fibres of the orbicular muscle were easily made out running over the tumour, and were pushed aside with facility. The growth was then dissected out with the handle of the knife and a strabismus hook, and was removed with comparative ease, no very firm adhesion being found except at one point. There was very little hemorrhage, and the wound was brought together with two sutures. It healed by first intention, and the child was discharged on the fourth day. The tumour proved to be a true cyst, with cyst wall and dense sebaceous contents. The wall of the sac was quite thick, and the microscope showed it to be composed of several layers of dense connective tissue fibres. There were no epidermal cells to be seen anywhere on its internal surface, and no hairs either loose or growing. There were a number of fat cells and some crystals of cholesterine in the sebaceous contents. Although there were marked evidences of chronic glandular trouble in the lid, yet there was no connection traceable by the naked eye between the blepharoadenitis and the cyst. It was separated by the whole width of the lid from the swollen margin, and seems to have developed as an autogenous growth in the submuscular connective tissue of this region. The malnutrition of the patient was no doubt closely connected with its formation, but exactly how might perhaps be very difficult to define.

CASE III. *Encysted Sebaceous Tumor of Right Upper Lid.*—Female child, æt. 5 months, of large size and the picture of physical health. Born healthy, and nothing abnormal was seen until the child was about three months old. Then the mother noticed at the external angle of the upper lid of the right eye a small nodule projecting, which was freely movable and occasioned no pain. It remained unchanged for nearly a month, since which time it had increased in size somewhat rapidly. When I saw the child there was in the situation above mentioned a tumour as large as a large bean, limited below by the external canthal ligament, moderately hard and smooth, but slightly movable, but not adherent to the skin. It was so large as to produce considerable ptosis, but there was no reddening of the lid or conjunctiva, nor any sign of inflammatory action. The lid could be everted with some little difficulty, but there were no signs of the tumour on the conjunctival surface. The eyes and eyelids were absolutely healthy, and the mother stated positively that there had never been the slightest inflammation in them. A diagnosis was made of sebaceous cyst of the lid, and an operation was at once undertaken for its removal. The skin of the lid was divided horizontally, and this revealed the fact that in this case also the growth was submuscular. The wound was then enlarged, the muscular fibres were pushed aside, and the tumour then came into view. It proved to be rather firmly imbedded in the connective tissue, and some care was required in dissect-

ing it out. Unfortunately the cyst wall proved to be thin, and was ruptured before the operation was completed, a cheesy mass of firm consistence oozing out through the opening. The growth was then removed and freely laid open. It proved to be a sebaceous cyst with thin walls, but no fluid contents. The wound was closed by two sutures, and healed by first intention in about twenty-four hours, and the drooping of the lid soon disappeared. Here again we meet with a true sebaceous cyst developed in the submuscular connective tissue of the lid, having no apparent connection with either skin or tarsus, and in an absolutely healthy lid. The case is also of interest in connection with the preceding one. In both cases the growths were of the same nature, and yet one patient was strumous and emaciated, with chronic glandular disease of the lids, while the other patient was perfectly healthy. These two cases compared together show that clinical observation alone does not help us much in understanding the etiology of the growth, and suggest that a microscopical examination of the eyelid as a whole is necessary to aid us in getting at the root of the matter. Horizontal and vertical sections of the lid in its entire thickness, going well down into the tissues of the cheek in the first of these two cases, might perhaps show some connection between the cysts and the sebaceous glands of the lid, and thus throw some light upon their origin.

CASE IV. *Sebaceous Cyst of the Lid, which had undergone Partial Suppuration.*—The patient was a woman, æt. 45, with a large tumour in the right lower lid. The growth had made its appearance two years before I saw her, and had slowly reached its present size, without causing any pain and only a moderate amount of inconvenience, until within a month. Since then there had been some dull, heavy pain, and the skin had become swollen and reddened over the tumour. When she presented herself for treatment the deformity was very marked. The tumour itself was as large as a walnut, but the whole lid was swollen and reddened. The tumour was immovable and the skin overlying it was adherent to it. The growth was somewhat hard, but with an indistinct sense of fluctuation. The lid was pressed against the eyeball, but could be pulled away, showing the hyperæmic conjunctiva very plainly. Thinking that I had to do with a large chalazion which was on the point of suppurating, an incision was made in the ciliary margin of the lid, between skin and tarsus, and parallel to the latter, and the knife carried in deeply; but none of the characteristic contents of a chalazion were evacuated. The hemorrhage was considerable, but there was no pus or gelatinous matter. A horizontal incision was then made through the skin and orbicular muscle and the tumour exposed. There was apparently a wall to the sac, and an attempt was made to dissect it out, but failed, for it was so thin that it ruptured almost immediately, and a quantity of cheesy material and pus poured out from the opening. The sac was carefully emptied and cleansed, and an examination then showed that what had been mistaken for the wall of the cyst was nothing more than some layers of connective tissue, which acted as a wall to the collection of sebaceous matter. Suppuration and disintegration had probably begun here at the centre, and had been the means of setting up the inflammatory action throughout the lid. The absence of the cyst wall shows a lack of development in the growth, and the suppuration shows its failure to resist disintegration. I am inclined to think that if the lid could have been removed and submitted to microscopic examination, some connection might have been shown with the sebaceous glands

and hair follicles of the integument of the lid. The suppurative process would soon have involved the entire tumour, and instead of a sebaceous cyst there would have been simply an abscess. This would have complicated the differential diagnosis as to the growth of the tumour, and rendered still more obscure the question of its mode of origin.

CASE V. *Encysted Tumour of the right upper Lid and Eyebrow.*—The patient was a young man, æt. 23, who stated that he was born with the tumour, and that it had increased in size with the growth of the body. At the external angle of the right eye, involving the upper lid, the eyebrow and neighbouring part of the temple, was a large, smooth, pendulous and freely movable growth, occupying the outer third of the eyebrow, hanging over the upper lid and reaching in size a large pigeon's egg. The eye was closed by the pendulous overhanging mass, but there was still some power in the levator muscle. The orbicularis acted readily and well. The tumour had a broad base which was firmly adherent to the underlying bones. The skin over it was freely movable and natural in appearance. The superciliary ridge of the frontal bone and the external angle were distinctly flattened by the pressure of the tumour, and there was a distinct depression in the bone, extending for some distance along the orbital margin and out on the temple, in which the tumour rested, where the bone had been absorbed by constant pressure. The growth did not extend into the orbit, and there was no displacement of the eyeball, nor any interference with its movements. The acuity of vision was normal.

An exploratory puncture was made with a trocar, and the contents were submitted to microscopic examination, and proved to be fat cells and cholesteroline crystals. An operation was advised for its removal, but was refused, and the patient disappeared from observation.

Here was a pure case of congenital dermoid cyst, of rather unusual size. The adhesions to the periosteum were probably exceedingly firm, and the operation of dissecting out the cyst would have been attended with a good deal of difficulty. The hollow in the frontal bone in which the tumour lay may have been caused by an absorption of the bone from pressure, but as the tumour was congenital and had grown *pari passu* with the body, it is probable that the normal development of the frontal bone in this region was interfered with by the presence of the cyst, and a shallow cavity had resulted where a prominence naturally exists.

CASE VI. *Prelachrymal Fluid Cyst.*—The patient was a woman, æt. 55, who had noticed a swelling at the inner angle of the right eye for more than three years. At first it was quite small, but soon grew rapidly, and had been of about the same size for the past two years. There was no pain or any inflammatory symptom, but there was a constant overflow of tears. When she presented herself for treatment, I found a tumour about the size of a hazel-nut situated along the right side of the nose, and lying in the fossa exactly in front of the lachrymal sac, and precisely where a dacryocystitis with secretion of pus would show itself by a swelling. The skin was freely movable over it, and was not reddened or otherwise altered from the normal condition. The tumour was moderately hard and resistant, but there was an ill-defined sense of fluctuation, and the growth slipped about beneath the fingers like a marble, without moving from its base, which was firmly adherent to the subjacent parts. There was no purulent discharge from the lachrymal sac or nasal duct on pressure, but there was an overflow of tears when the tumour was compressed. Thinking that it might be a collection of tears and mucous in the lachry-

mal sac, owing to some obstruction in the nasal duct, the lower canaliculus was slit up and a probe passed into the sac, which, however, was found empty, and the probe, a No. 8 Bôwman, passed without any difficulty to the bottom of the duct. It was then seen that a cyst of some sort was present, lying in front of the lachrymal sac, and having no connection with it, and an attempt was made to remove it. A long vertical incision was made through the skin over the tumour, and as the wound gaped the cyst almost immediately presented itself. The skin overlying the cyst was then slowly and carefully dissected away on all sides with some little difficulty, but on the side of the nose the adhesions were found to be very firm, and an unfortunate slip of the knife handle caused a rupture of the cyst wall, and an evacuation of an amber-yellow, oily fluid, which towards the last became somewhat greenish in colour. The cyst immediately collapsed, and the dissection of the wall, from its deep attachments, had to be done piecemeal. The wall of the cyst came away in shreds, and the adhesions to the periosteum and canthal ligament were so dense and firm that the edge of the knife had to be resorted to. After the entire cyst had been removed, and the cavity syringed out, the bone was found so denuded that it was feared the periosteum had been removed in the operation. One suture was introduced at the top of the wound and the rest left open under carbolized lint. Quite free suppuration ensued with considerable swelling and inflammation of the skin and neighbouring parts, but these symptoms gradually subsided, the cavity began to granulate from the bottom, and at the end of the third week was entirely closed.

The cyst wall, on being examined, was found to consist of several layers of connective tissue pressed together so as to make a very dense structure though comparatively thin. The inner surface was very smooth and shining as if covered by a membrane, but neither sections nor surface preparations showed any epithelial formation.

These prelachrymal cysts are rare. Verneuil reported three cases to the Société de Chirurgie de Paris, in 1876, and an abstract is given of them in a paper by the writer, published in the *American Journal of the Medical Sciences* for January, 1878, and already referred to. They have no communication with the lachrymal sac, and Verneuil considers them in most cases congenital, and states that their contents resemble olive oil. The origin of the oily contents is however unknown.

47 EAST TWENTY-THIRD ST.

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#### ARTICLE VII.

ULCERATIVE PHTHISICAL LARYNGITIS; ITS NATURE, AND THE VALUE OF TRACHEOTOMY IN ITS TREATMENT. By BEVERLEY ROBINSON, M.D., Lecturer upon Clinical Medicine at the Bellevue Hospital Medical College,<sup>1</sup> New York.

UPON two occasions<sup>2</sup> last year I had the honour of presenting at the New York Pathological Society, specimens of ulcerative disease of the

<sup>1</sup> Read before the Medical Society of the State of New York, Feb. 6, 1879.

<sup>2</sup> April 25, and Nov. 14, 1877.

larynx, taken from patients who died in my service at Charity Hospital. These patients were both affected with catarrhal phthisis. In the first case there was found at the autopsy secondary tubercularization of the lungs, pleura, kidneys, peritoneum, and the small intestine showed scattered phthisical ulcerations. The condition of the larynx was as follows, according to the post-mortem record made twenty-one and a half hours after death, by Dr. E. A. Maxwell, one of the curators to Charity Hospital: "Both vocal cords show about their middle portion, at upper and rim borders, longitudinal ulcerations, while the rim of vocal cord is thickened. At posterior commissure of each is an irregular spot, where mucous membrane is eroded; interior mucous membrane is congested." This larynx was afterwards examined microscopically at my request by Dr. Thomas E. Satterthwaite, curator to St. Luke's and Presbyterian Hospitals, and no evidence of tubercular deposit was found. The ulcerations of the larynx were therefore considered to be catarrhal in nature. In my second case there were no miliary tubercles in any of the viscera, but the patient presented a large gangrenous cavity of the right lung. His death was probably occasioned by œdema of the aryepiglottic folds. The larynx offered the following appearances: "The tissues of the epiglottis very lax, and curving inward; its mucous membrane, just above the ventricular bands, show numerous small superficial ulcerations. The vocal cords of both sides (?) show œdema, but that of left side more marked, and so much as to almost obliterate sacculus of this side." (Spencer, Curator to Charity Hospital.)

In relation to this case I made the following remarks: "The ulcerations of the larynx are evidently catarrhal in nature, and there is, at least to ocular examination, no tubercular deposit." This opinion was fully corroborated at a later meeting of the Society<sup>1</sup> by the report of the microscopical committee to whom the larynx was referred, which report read as follows:—

"To external appearance there was no decided lesion of the larynx, more than that the surface of the mucous membrane was rough, especially at the base of the epiglottis, and from this point down to and over the lower vocal cords.<sup>2</sup> There was no decided elevation of the mucous membrane, indicative of *miliary tubercular granulations*. On section of the tissue between the epiglottis and upper margin of the upper vocal cord a number of yellow, circular spots were noticed in the submucous tissue. They looked to the eye like cheesy nodules, and varied in size from a pin's-head to a No. 2 shot. No miliary granulations were seen anywhere. Examined microscopically, it was seen that these spots had undergone granular and fatty change, as is seen in the so-called "*yellow granulations*." The submucous tissue was in places densely infiltrated with lymphoid corpuscles, chiefly about the mucous glands, but neither *adenoid tissue* nor *giant cells* were seen. The epithelium of the surface showed the characteristic cylindrical form that occurs throughout almost the whole of the larynx, and was intact except in

<sup>1</sup> December 12, 1877.

<sup>2</sup> Ocular appearances had changed within a few days after the post-mortem, owing to the action of dilute alcohol, in which the specimen had unfortunately been immersed at first.

a few places, but never wholly gone. In these places the epithelium was low, deformed, and did not take the colouring matter. The elongated papillæ seen on the true vocal cords and in the posterior foldings of the mucous membrane, near the arytenoid cartilages, were normal."

The interest of the two cases, an abstract of which I have just read, relates in great measure to two important questions: 1st question: What is laryngeal phthisis? Is it simply the irritation and ulceration of the glands of the larynx resulting from the passage of pulmonary sputa over the surface? Are tubercles at times developed in its tissues?

2d question: If the former belief be the correct one, or generally and nearly so, how far is it justifiable to perform tracheotomy in the earlier stages of ulcerative laryngitis of this nature as a *means of cure*?

In reply to the first question, What is laryngeal phthisis? I shall be brief, but not too much so, I trust, to make my readers share my personal convictions. The opinions of eminent microscopists are about equally divided to-day between those who admit the presence of tubercle as *frequent* in the mucous membrane of the larynx (Virchow) and those who believe that it is there seldom met with (Rindfleisch). A few observers boldly affirm that tubercle *never* exists in the larynx (Rühlé). With frequent opportunities of observation during several years past, I hold the position of not being able to discover the tubercular granulum in the larynx either before or after death, and whilst I do not positively deny its existence, I am of opinion that it must be extremely rare in this situation. The elevations which have been described in the larynx under the name of miliary tubercle, are none other, as a rule, than small spherical swellings, which are occasioned by the filling up with transparent fluid of the closed follicles of the submucous reticulum, which have been described in the normal larynx by Heitler<sup>1</sup> and Coyne.<sup>2</sup>

The liquid contained in the follicles is not long in becoming opaque, its limiting wall loses its epithelial covering, then expands, and finally breaks, leaving behind a small circular, rather superficial ulceration. These follicles are found in pathological as in healthy conditions, more frequently over the false cords, and in front of the arytenoid cartilages than elsewhere. I have not been fortunate in recognizing them often, and, on this account, am disposed to believe that they become eroded, and lose their contents very rapidly after once being formed. They have been seen infrequently on the free margin of the epiglottis, and, when there present, the prognosis, according to one accurate observer,<sup>3</sup> Dr. Wm. F. Duncan, of New York, has always been considered unfavourable. In this connection, and inasmuch as I myself do not remember to have seen these elevations on the free margin of the epiglottis, I would remark that the latest and most careful histological researches do not sustain Dr. D.'s view, since

<sup>1</sup> Stricker's Med. Jahrb., vol. iii., iv., 1874.

<sup>2</sup> Recherches sur l'Anatomie Normal de la Muqueuse du Larynx, Paris, 1874.

<sup>3</sup> Oral communication.

they make no mention of closed normal follicles at this place. The closed follicles of the larynx become enlarged, doubtless, under similar conditions with those which cause the closed follicles of the pharynx or of the intestine to become prominent. These conditions are, on the one hand, the dyscrasic constitution of the patient, viz., catarrhal, phthisical, and scrofulous; and, on the other, the passage of secretions, occasioned by an inflammatory processus, over the region of their anatomical site. But does ulceration, even of catarrhal type, always affect the closed follicles within the larynx? Unquestionably not. The racemose, multilocular glands are also frequently the seat of ulcerative processes, especially about the orifices of their ducts. These ulcerations coalesce afterwards, and are oftentimes of extensive area and irregular contour. It may be, also, that they at times become directly inoculated by the passage of sputa containing real tubercular débris. It is not correct, however, at the actual date of our information, to attach primary importance to infiltration of lymphoid corpuscles around glands, for these latter are already present in a state of health; and though more numerous in the phthisical ulcerations than they are normally, the action of catarrhal inflammation is sufficient to account for this fact, without an attempt being made to establish the tubercular nature of the affection. What lends additional weight to this view of the non-tubercular nature of laryngeal phthisical ulcerations, in the great majority of cases, are the occasional evidences of cure observed by well-known laryngoscopists. Cohen and Isambert, notably, have seen these ulcerations heal and perfectly cicatrize; and this was true, in a few instances, even though the lungs were already affected with phthisis. And in my own city of New York, Drs. Frank Bosworth and Wm. F. Duncan have had latterly some remarkable results which are attributed by them to their method of treatment. This mainly consists in repeated and very thorough cleansing of the laryngeal surfaces by means of a carbolic and alkaline spray (Dobell's), followed by topical applications, with mild astringents and iodoform, combined with morphia. I regret to add, personally, I have never been able to obtain such encouraging curative effects, but doubtless this is properly accounted for by less methodical and rational measures.

Before leaving my first question, I cannot forbear to cite from the second edition of Rindfleisch's *Pathological Histology*, to show that this learned microscopist, whilst admitting the *possible* presence of miliary tubercles in laryngeal phthisis, nevertheless attributes to them a very subordinate rôle in the evolution of this disease.

"When we see," says Rindfleisch (p. 371), "that the most important and the severest destructions of the *larynx* and trachea are produced *alone* by *catarrhal* inflammation and ulceration, we reasonably ask ourselves what, then, remains *there* for tuberculosis to do?" To this he replies, some lines further on: "These tubercles certainly lie so individualized and beside the inflammatory infiltration of the real surface of ulceration, are such insignificant new formation, that I would only regard them as a pledge of the connection of this process with consti-

tutional tuberculosis. At the most, we might ascribe to them the valuation of a permanent inflammatory irritation, and to trace back to this the obstinacy and the tendency to relapse, which is peculiar to these catarrhal inflammatory conditions."

Between this view, reported verbatim, and the one I hold, there is, as will be remarked, a very slight divergence. Having admitted the usual nature of phthisical ulcerations of the larynx, what may be the value of tracheotomy in this disease?

Manifestly, in order that the best attainable results may be secured by tracheotomy, the ulcerative disease of the larynx should not be permitted to make too great progress. In order to have legitimate hopes of benefit to the patient from this operation, the ulcerations must yet be limited in their action to the mucous membrane, or the soft tissues beneath. When the cartilages are attacked by caries, or necrosis, and concomitant ankylosis of the articulations is present, it would be almost irrational to expect any very decided improvement from tracheotomy, much less an absolute cure. Tracheotomy, if indicated at all, therefore, as a curative procedure, must be performed in the earlier stages of ulcerative disease, or more definitely, perhaps, at that period when the nature of the ulcerations is obvious, and local treatment appears of little avail. And even conceding that the favourable results obtained by Drs. Bosworth and Duncan<sup>1</sup> should be accomplished by other laryngoscopists, I would only find stronger reasons for urging the importance of tracheotomy as a means of cure. For what do we hope to gain by tracheotomy? 1. Rest of the larynx during respiration. 2. Prevention of frequent contact of atmospheric air in motion, and of purulent fluids, with a surface upon which they have occasioned disease, and are still maintaining it. Now, I can but believe that if ulcerative phthisical disease of the larynx can occasionally be cured by mere topical applications, without the above imperative conditions, embodying the very first principles of surgery, much more readily and frequently must similar results follow when these essential indications are attended to as well as is possible. We all know that we never make a single inspiratory effort unless the vocal cords, and therefore the intrinsic muscles of the larynx themselves, are put in active motion. Suppose, then, that an ulceration be seated on one of these cords, or upon the arytenoid cartilages, with their continual slight rotatory movements, and what should we expect but constant irritation of an already inflamed tissue? Moreover, do not the very latest investigations prove conclusively that even though there be no ulcerations, there is in pulmonary phthisis

<sup>1</sup> Unpublished Minutes of the New York Laryngological Society, June 13, 1878. Their statistics read as follows: 20 cases of laryngeal phthisis, treated at the Bellevue Clinic during the year ending June, 1878; 1 died from catarrhal pneumonia after tracheotomy; 5 disappeared improved; 1 disappeared, and probably died; 5 are left with a simple catarrhal laryngitis; 1 cured; 6 under treatment, and improving; 1 under treatment, and not improving.



frequent atrophy of the intra-laryngeal muscles by reason of compression of the primitive muscular fascicles, consecutive to abundant proliferation of cellular elements of the connective tissue in the interior of the muscle.<sup>1</sup> This fact, therefore, furnishes additional reason for giving the larynx rest from *involuntary* movements. In regard to voluntary movements, the operation must be serviceable, because the patient is less prone to use his voice when compelled to stop up the external orifice of his tube in order to articulate, than he is when no such necessity exists.

In regard to the injurious action of air and the passage of purulent fluids upon an exposed, raw surface, need I insist? How do we treat ulcers elsewhere situated? Is it not in accordance with the simplest axioms of surgical knowledge to keep them as clean as possible in so far as morbid fluids are concerned, and also to protect them from the irritative effects of air by simple or other dressings? Now let us judge the question of intra-laryngeal ulcerations by the effects of treatment. I, for one, affirm emphatically that all caustic substances are radically wrong when applied to the ulcerated laryngeal surfaces of phthisis. They only inflame them still more, thereby increasing the discomfort and pain of the patient in swallowing and breathing. Never have I known them to exercise any decided curative effects. In my own practice, in fact, I rarely, or never nowadays, employ even mild astringents in the treatment of ulcerative laryngitis of phthisis, and in this I differ with Drs. Bosworth and Duncan, but I rely exclusively for the relief of pain and irritation upon the use of anodynes such as morphia and laudanum alone, or combined with powdered gum or iodoform.<sup>2</sup> Now do not these remarks go to show still further the importance of removal of causes of irritation by isolation (in a certain sense)? It may be mooted whether attention to all these indications can be of much utility in ulcerative disease which is of tuberculous nature. When carried out practically they may be curative in catarrhal ulcerations. But we doubt such results, say some, in genuine tubercular ulcerations. That these latter are very infrequent, I have already stated, but when present that they will be very favourably influenced, if not entirely cured, by tracheotomy, I have good reason to believe when I consider the remarkable change in local appearances obtained in a case of epithelioma laryngis (a more unfavourable affection if possible, than tubercular laryngitis), presented within a few months by me to the New York Pathological Society.<sup>3</sup> Moreover, we should consider in *all* cases of ulcerative phthisical laryngitis, that tracheotomy is not merely *a* means but the *sole* means at our command of putting the larynx at rest and shielding it from pernicious contacts. Now it has been affirmed that in many of these cases

<sup>1</sup> Fränkel, quoted in *Revue des Sciences Med.*, 15 Octobre, 1878, p. 667, from *Archiv. für Patholog. Anat. und Phys.*, t. Ixxi. p. 261.

<sup>2</sup> The powder of iodoform has very marked anæsthetic effects upon all laryngeal ulcerations.

<sup>3</sup> October 8, 1878.

of ulcerative phthisical laryngitis, death does not occur on account of this condition but rather from the presence of advanced phthisical disease in the lungs themselves. Besides, it is added, the intra-laryngeal affection is wholly dependent upon the lung trouble, and if the latter were cured, the larynx would also become rapidly healthy. Special attention, therefore, as regards curative measures should alone be paid to the care of the lungs, and the larynx need not be considered as of great importance. In answer to this I would say that whilst many cases undoubtedly die directly from the phthisical affection of the lungs rather than from the laryngeal ulcerations, still when this affection is present it always aggravates the sufferings of the patient and increases the probabilities of a fatal termination. Sometimes it causes local pain and augments the severity and frequency of cough, sometimes it increases the already existing obstruction of respiration, and renders deglutition extremely difficult. Occasionally all the preceding symptoms will appear in the same individual, and thus render his or her condition especially distressing.

In view of these facts, I therefore maintain that when ulcerative laryngeal disease manifests itself in cases of pulmonary phthisis, it always aggravates the primary disease and makes its march towards a fatal termination more rapid and deplorable. To those instances in which the intra-laryngeal ulcerations are only a somewhat tardy complication of pulmonary phthisis, we are of necessity forced to give a place to varieties in which the ulcerations of the larynx show themselves at a very early stage of impaired health. Frequently these forms are also associated with evident signs of intra-pulmonary lesions. But this is by no means a universal rule, and I have seen phthisical ulcerations of the larynx when the existence of physical signs of lung disease was extremely doubtful, not to say, entirely absent. Under these circumstances, I now feel almost convinced, if tracheotomy had been performed at an early date, the patient might have been entirely cured, both of the pulmonary and the laryngeal disease. In other instances the submucous infiltration increases rapidly, whilst the ulcerative disease is extending itself, and finally the thickened epiglottis and pyramidal masses formed by the arytenoid cartilages and ary-epiglottic folds are of such dimensions, that when acute inflammation (through exposure or fatigue) becomes grafted upon the chronic disease, our only alternative is to perform tracheotomy, so as to relieve dangerous dyspnoea. In almost every case of this description it can be shown, I believe, that the operation is not risky, if carefully performed, and is of great benefit in speedily alleviating most of the harassing symptoms of which I have spoken above, and perhaps in adding to the chances of the ultimate cure of the patient.

Are there any cases which go to prove this statement and further to indicate the probable value of tracheotomy as a curative procedure in ulcerative phthisical disease of the larynx? There are without doubt, a few

recorded, and there are quite a number of which I have had oral information from members of our profession.

One of the most instructive of which I have knowledge is that of a patient presented to the members of the New York Pathological Society, at a meeting held January 9, 1878, by Dr. J. H. Ripley, surgeon to Charity Hospital.

The patient of Dr. Ripley had evident pulmonary phthisis at an advanced stage, viz., a large cavity in the left lung, with consolidation of right apex. Two months previous to being seen by Dr. R. he had become aphonic, and to loss of voice difficult respiration was soon added, and had been getting so much worse within a few weeks as to frequently awaken him at night with a sense of impending suffocation. On December 23, 1877, he was brought to St. Francis's Hospital, suffering from laboured and stridulous breathing. The face was dusky, and the pulse frequent and feeble. Tracheotomy was performed, and the relief following the operation was very great. Sixteen days later the patient's breathing was free, his appetite much improved, and his cough greatly moderated. When the tube was removed and the external wound closed, he could speak with almost natural clearness, and there was less dysphagia. Dr. Elsberg examined the larynx six hours after the operation and dictated the following: "I find the soft parts at the entrance of the larynx much hypertrophied, and the whole interior filled with swollen, infiltrated tissue; the aryteno-epiglottidean folds form great cushions, which meet in the median line. In my opinion, this condition would have proved rapidly fatal without tracheotomy." Dr. Elsberg re-examined the larynx on January 8, 1878, fifteen days after the operation. He then said, "The swelling and infiltration of the parts have mostly disappeared; the mucous membrane is pale, and the superficial vessels enlarged."

"It would seem from the foregoing facts," says Dr. Ripley (*Med. Record*, Feb. 23, 1878), "that tracheotomy has in this case accomplished these results: 1. It has relieved symptoms. 2. It has prolonged life. 3. So far as the larynx is concerned, it has proved curative."

In the debate which follows the report of the foregoing case Dr. Elsberg remarked that he had *seen* (?) tracheotomy performed five or six times, but the operation had been done by other practitioners in accordance with his advice, probably twenty times. As far as the immediate condition of the patients after the operation was concerned, the results were satisfactory. Dr. Briddon also concurred in the belief "that such ulcerative diseases were benefited by the rest which tracheotomy could give them."

In the minutes of the meeting of the Laryngological Society of New York, held April 11, 1878, a case of ulcerative phthisical laryngitis, in which laryngo-tracheotomy had been performed, is referred to by the operator, Dr. Wm. F. Duncan. To this gentleman I am indebted for full notes of his valuable case. From it I shall only repeat a few important points, which have direct reference to the subject under consideration.

"At the time of operation in this instance, the lungs *appeared* sound. The intra-laryngeal condition looked hopeless. Tracheotomy was suggested as a curative measure, the idea in mind being to give the larynx rest, and after the operation to continue its local treatment.

"March 1, 1878, operation was performed with assistance of Drs. Bosworth, Parks, and Swinburne. The immediate effect of putting the larynx at rest was to remove the pain in the throat, and to restore easy deglutition. Two days later a laryngoscopic examination was made, and the epiglottis was seen to be less

œdematous, and the swelling over the arytenoids and ary-epiglottic folds greatly reduced. The larynx continued to improve steadily for three weeks, at which time the patient caught cold from coming out in a rain-storm. From this period she grew worse, both as regards her larynx and lungs, and died on June 5th, of catarrhal pneumonia.

“ ‘The immediate improvement,’ says Dr. Duncan, ‘after inserting the tube, would seem to warrant the expectation that it might be made continuous in a similar case. And it should be remarked that the first interference with the improvement of the diseased larynx occurred after catching cold from exposure to a severe rain-storm.’ ”

To the preceding cases I shall add four others, viz., those reported by Dr. Serkowski,<sup>1</sup> of which an analysis will be found in the *Clinic* of September 22, 1877, and two others which have come to my knowledge through Dr. Charles McBurney, of New York.<sup>2</sup> One of Dr. Serkowski's patients died three years after tracheotomy was performed, from advanced pulmonary phthisis; the other is still alive, seven years after the operation, and in apparent good health. Dr. Serkowski believes that the opening of the trachea was not only of temporary benefit, but that it prevented extension of tuberculosis. The first of Dr. McBurney's patients affected with ulcerative phthisical laryngitis, was operated upon by himself. This individual died subsequently of phthisical ulcerations of the bowels, and his pulmonary phthisis was also far advanced. In the instance just cited, besides the relief to deglutition and respiration afforded by tracheotomy, Dr. McBurney did not remark, up to the time of death, six weeks later, any very decided improvement in the intra-laryngeal appearances. The other case, Dr. McBurney saw *once* prior to tracheotomy and diagnosed laryngeal phthisis. Sometime after the patient returned to him with a cicatrized wound and an apparently healthy larynx. This man had had tracheotomy performed on account of dyspnoea arising from phthisical obstruction of his larynx, and had improved so much as to be able to dispense with his tube and allow the wound of the trachea to close. He died later on of acute pleurisy, and it was stated by the physician who performed tracheotomy that he had *not* laryngeal phthisis, and this opinion was based upon another expert examination. This case must, therefore, remain one of doubtful signification.

Within a few days, and since writing what precedes, I have been witness of an operation of prophylactic tracheotomy in ulcerative phthisical laryngitis, performed by Dr. Morris Asch, Surgeon to the New York Eye and Ear Infirmary. In this instance, physical signs of pulmonary phthisis are present, although the *stage* of the lung affection should still be considered doubtful and is probably not advanced.

Dr. Asch's operation took place on January 27, 1879. Five days later, I received the following letter from the House Surgeon of the New York Infirmary (H. S. Oppenheimer) in regard to his then present con-

<sup>1</sup> Przegląd Ckarski, No. 13, 1877. Allg. Med. Central-Zeitung, No. 65, 1877.

<sup>2</sup> Oral communication.

dition. This letter reads as follows: "The patient whom you saw tracheotomized last Monday is sitting up since yesterday. His appetite is better than it was before the operation, according to his own statement, and the dysphagia less. Dr. Asch finds, on examination to-day, less swelling of the ventricular bands, some diminution of the œdema in the ary-epiglottic folds, absence of the slight erosions which existed in the folds and improvement of the ulcerations of the true vocal cords."

The subject of this paper is in part *new*, but none the less important and interesting to the general practitioner and to the specialist. Tracheotomy as an *operation of necessity, or dernier ressort*, is perfectly familiar to all practitioners.

But tracheotomy as a *prophylactic*, or as a *remedial* operation, at an early period of a chronic disease of the larynx, hitherto believed to be incurable in the great majority of instances, is a very different operation, looked at in regard to its *indications*, and its *possible*, or *probable* results. As such, I believe, it merits attention. Ere long I trust that other and well-observed histories may be published, which shall corroborate the facts I have here brought forward. Personally, I have the conviction, that within a brief period from this present, tracheotomy will frequently be performed as a trustworthy *remedial* operation in ulcerative phthisical laryngitis. I believe this: 1st. Because I believe that ulcerative phthisical laryngitis is usually *non-tubercular* in its nature, and therefore *curable*. 2d. Because tracheotomy seems to me the best, if not the sole means, of directly attaining this end.

Meanwhile, and without prejudging final conclusions, I respectfully offer the following:—

1. Ulcerative phthisical laryngitis is rarely a tubercular disease.
2. Topical medication, methodically and carefully carried out, is extremely serviceable, if not always curative.
3. Tracheotomy is certainly a palliative procedure of much value, and ultimately may be found a direct curative means yielding very favourable results.
4. To obtain these latter, it seems indicated not to delay the operation to a late date, but rather to perform it so soon as the nature of the disease is obvious, and other measures appear of no avail.

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#### ARTICLE VIII.

CASES TREATED BY THE ANTISEPTIC METHOD AT ST. MARY'S HOSPITAL,  
PHILADELPHIA. By J. H. EWING, M.D., Resident Surgeon.

THROUGH the courtesy of the attending surgeons, Drs. Keen, Grove, and Mears, who have kindly allowed the use of the material, I report a

number of cases treated by the antiseptic method, followed by remarks on the results obtained and the value of some experiments made as to minor details of dressing. The treatment was first used during the attendance of Dr. W. W. Keen, in January, 1878, and has been continued ever since in almost every case to which it was applicable. All these cases were dressed with every particular of Lister's method, including of course the spray.

CASE I. *Anchylosis of Ankle with Talipes Equinus; Anchylosis broken up by Chisel, and severe injury to Soft Parts; Insufficient Drainage causing Temporary Fever on Eighth Day; Recovery with Useful Limb.*—Hugh G., aged 18 years, admitted Nov. 15, 1877; service of Dr. Keen. Nine years ago he received an injury which resulted in bony anchylosis of left ankle-joint (talipes equinus), and a chronic ulcer of calf of same leg. When first seen his general health was good. January 20, 1878, tendo-Achillis divided subcutaneously, but position of foot was not improved.

Jan. 26. The following operation was performed to place the foot in a favourable position for walking without crutches. The patient under the influence of ether, two oblique incisions were made at the angles of junction of the horizontal and vertical surfaces of the astragalus, and a chisel three-quarters of an inch broad was inserted in four places, between the malleoli and the outer surfaces of the astragalus, and between the horizontal articular surface of the tibia and upper surface of the astragalus, severing almost completely the astragalus from the tibia and fibula; and the bony adhesions were then broken up. A long cicatrix, extending from the inner malleolus to the ball of the great toe, was divided in its whole length to loosen it from the tissues beneath, and the tendo-Achillis and the plantar fascia were divided, the latter in two places. Force was then applied to place the foot at a right angle, but all the force used could not place it at an exact right angle, but say at an angle of  $110^{\circ}$ . Two drainage-tubes were placed in the incisions. The antiseptic dressing was then applied, and the leg and foot placed on a posterior rectangular splint reaching to the sole. The patient was placed on a light diet.

27th. Slept poorly, has no appetite, and suffers a little pain. The part was dressed, and a few drops of bloody discharge came from the drainage-tubes, but no pus. Morning temp.  $100^{\circ}$ , pulse 120; evening temp.  $101^{\circ}$ , pulse 120.

28th. Slept well, appetite good, and no pain. The dressing was changed because of a serous discharge which had reached the edge of the dressing; no pus. Morning temp.  $99^{\circ}$ , pulse 100; evening temp.  $100^{\circ}$ , pulse 100.

30th. The drainage-tubes were removed. Temp. normal since the 28th.

Feb. 3. Up to this time the patient has done admirably, not a drop of pus appearing on the dressing, but to-day a sudden rise of temperature was observed, for which no cause could be found. Morning temp.  $101^{\circ}$ , pulse 100; evening temp.  $103^{\circ}$ , pulse 120. He was also restless, and did not sleep.

4th. In consequence of the continued rise of temperature another careful examination was made, some bagging found where the long cicatrix had been divided, an opening was made and a drainage-tube inserted; a

few drops of serous discharge came from the opening. Morning temp.  $101^{\circ}$ , pulse 160; evening temp.  $100^{\circ}$ , pulse 110.

5th. Morning temp.  $101^{\circ}$ , pulse 110; evening temp.  $101^{\circ}$  pulse 110.

6th. Morning temp.  $101^{\circ}$ , pulse 120; evening temp.  $102\frac{3}{4}^{\circ}$ , pulse 120. Did not sleep well, and appetite is lost. Bagging was found above the heel, evidently from the chisel cut eleven days before. A counter-opening was made by the side of the tendo-Achillis, letting out some bloody serum without smell, and a drainage-tube was inserted.

7th. Slept well, and appetite improving. No pus came from the opening above the heel, but a few drops from the opening in the cicatrix. Temp. normal.

9th. Temp. normal, and he is improving rapidly. Ulcer dressed antiseptically.

15th. Drainage-tubes removed; has had no more fever, appetite good, and sleeps well. The discharge for each day has not been more than  $\frac{3}{4}$ ss, and non-purulent. Dressings have been changed each day; ulcer, which was nearly as large as the hand, has not much improved, but the amount of pus has diminished.

26th. The parts have all healed except the opening above the heel, which discharges about  $\frac{3}{4}$ ss of healthy pus during the twenty-four hours.

May 4. The wounds in the foot are well, and the antiseptic dressing was discontinued. The ulcer has not improved very rapidly under the antiseptic treatment, and it was also discontinued, and the part strapped with adhesive plaster.

11th. The patient discharged with a useful limb. The foot was near a right angle, and there was slight motion in the ankle-joint. Ulcer all healed except a healthy granulating surface as large as a silver dollar.

CASE II. *Large Abscess of Neck; Incision; Recovery without further Suppuration, and without Fever.*—Sarah K., aged 35, admitted February 4, 1878; service of Dr. Keen. Mother died of phthisis and brother scrofulous. Has never had good health, and when four years old had a sore on the leg for seven years; has also constitutional syphilis. Eleven months ago began to suffer from sore throat, and a swelling appeared at angle of left jaw. On admission was very weak; could not open mouth; was fed with liquid food, and an abscess nearly as large as the first occupied left side of neck.

6th. Under influence of ether an incision two inches long was made and  $\frac{3}{4}$ iv of pus evacuated, and a drainage-tube inserted.

7th. Temp. normal; slept well; dressing changed, and a few drops of pus found—a remnant of the abscess.

9th. Temp. normal; dressing changed, and a few drops of pus found.

11th. Dressing changed, no pus.

13th. Dressing changed; temp. normal; drainage-tube removed; wound nearly united.

17th. Discharged well.

CASE III. *Fibroma of Testicle; Removal; Union by First Intention, without Fever.*—Charles K., aged 32, admitted February 22, 1878; service of Dr. Keen. States that four years ago, after lifting a heavy stone, left testicle began to swell. On admission it was larger than the fist, firm and hard, without pain or fluctuation, though it was quite elastic.

Feb. 25. Under ether an elliptical incision four inches in length was made, and testicle removed. The individual vessels of cord were tied, six catgut ligatures used, and part united by five sutures, a bundle of

horse hair having been inserted for drainage; antiseptic dressing was then applied.

26th. A few drops of bloody serum on dressing. Temp. continues normal.

28th. Dressing changed. Temp. normal.

March 2. Parts healed by first intention, and dressing abandoned for carbolized iard. A swelling about an inch in diameter is noticed at external abdominal ring, at end of the spermatic cord. Temperature normal.

7th. Flaxseed poultices applied to swelling.

18th. Swelling has subsided; poultices abandoned.

21st. Discharged well.

CASE IV. *Coxalgia; Resection; Highest Subsequent Temperature*  $99\frac{1}{6}^{\circ}$ ; *Healing by First Intention, with very slight Suppuration around Drainage Tube.*—James F., aged 13, admitted February 21, 1878. Service of Dr. Keen. General health always good until September, 1877, when he had an attack of pleurisy. While convalescing he began to have pain and tenderness in the right hip, the pain shooting down back of leg to knee. Was put to bed and treated for rheumatism. Has a family history of scrofula.

When admitted was extremely pale and cachectic, suffering much pain; had no appetite, and could not sleep. It seemed scarcely probable that he would live more than a few days, he was so weak. The whole hip was enlarged, hard, and tender; leg flexed on thigh, thigh on pelvis, and pelvis tipped forwards. Could not lie on back, because of pain which pressure on gluteal region gave. Anteriorly, a short distance from anterior spine of ilium, was a small, red, fluctuating spot, which opened spontaneously in about three days, and a small quantity of watery pus was discharged. Leg could not be moved without considerable pain.

No operation was possible in his existing state of health, and the only object was to build him up. Ordered cod-liver oil, iron, and quinia, and poultices applied to hip. Under this treatment he improved, but was not in a condition for operation until June. At that time his general condition had much improved, appetite good, and he suffered very little pain unless the leg was moved, but was not able to be out of bed. There were now four sinuses communicating with joint. Crepitation in hip-joint.

June 7. Service of Dr. Grove. Under ether a curved incision, reaching to the bone, was made, commencing a short distance above the great trochanter, curving backwards and downwards about three and one-half inches. After division of capsule the headless end of bone was protruded through the opening, and sawn off just below lesser trochanter. Head of bone was found lying loose in acetabulum, and was rolled out like a billiard ball; ligamentum teres entirely destroyed; head of the bone denuded of its cartilage, and eroded; neck and trochanters softened and carious. About three inches of bone were removed; acetabulum was slightly diseased on its anterior part, which was scraped, and all the diseased bone removed. Wound was washed out with the  $2\frac{1}{2}$  per cent. solution, a drainage-tube inserted, and edges drawn together with iron-wire sutures. A small carbolized sponge was placed over drainage-tube to catch the expected abundant serous discharge of first twenty-four hours, and antiseptic dressing applied over this. He was placed in an apparatus composed of two side-splints extending from each axilla to about twelve inches below the foot, and there connected together by a cross-board. The splints were well padded and bound to legs and body, and extension made



from the cross-board by adhesive plaster on both legs; right leg was pulled down until it was about half an inch shorter than left. Suffered much from shock and pain, and required strong stimulation, and morphia, gr.  $\frac{1}{4}$ , hypodermically. For night, whiskey,  $\mathfrak{z}$ ss, every two hours in milk.

8th. Slept well, but very weak; whiskey continued every two hours, with milk and beef-tea; morphiae sulph., gr.  $\frac{1}{4}$ , morning and evening, hypodermically. Dressing saturated this morning with bloody serum, and was changed. Morning temp.  $99\frac{1}{2}^{\circ}$ , pulse 100; evening temp.  $99\frac{1}{2}^{\circ}$ , pulse 100.

9th. Slept well; suffered very little pain; is still very weak. Stimulants continued. Morning temp.  $98^{\circ}$ , pulse 100; evening temp.  $99\frac{1}{2}^{\circ}$ , pulse 105.

10th. Condition much improved, stronger, and more cheerful; whiskey diminished to  $\mathfrak{z}$ iv for the twenty-four hours. Dressing changed, and parts look well. Morning temp.  $97\frac{3}{4}^{\circ}$ , pulse 105; evening temp.  $98^{\circ}$ , pulse 100.

11th. Improved in strength. Morning temp.  $97\frac{1}{2}^{\circ}$ , pulse 105; evening temp.  $97\frac{1}{2}^{\circ}$ , pulse 100.

12th. For first time a few drops of pus were discharged. Morning temp.  $99\frac{1}{2}^{\circ}$ ; evening temp.  $99^{\circ}$ , pulse 100. Ordered pyrophosphate of iron, gr. iiss three times a day.

18th. Up to date temp. has been normal. Sutures were removed, and wound found to have united by first intention, except where drainage-tube was, and it was also removed. Wound has been dressed every second day, and about one drachm of healthy pus discharged during the twenty-four hours.

July 1. General health very much improved. Wound dressed every third day since last date, and whiskey reduced to a tablespoonful three times a day; the same diet continued.

10th. Splints removed; wound healed, except where the drainage-tube had been.

20th. The dressing continued. A small opening still remained, which discharged a small quantity of pus.

Aug. 1. He walked about the wards by supporting himself by the side, and is on general house diet.

Sept. 15. He walks very well with a cane; general health very good. Two small openings remained in line of incision, at bottom of which a small fragment of dead bone could be felt. Limb shortened three inches.

Nov. 25. One small fragment of bone discharged; another can be felt, and will be discharged soon. He walks without crutches, bearing his entire weight on leg, limping somewhat on account of shortening, which will be corrected by a thickened sole.

CASE V. *Coxalgia; Resection; Highest Temperature  $99\frac{1}{2}^{\circ}$ , except Ephemeral Fever on 3d to 4th day; Union by First Intention, with very slight Suppuration around Drainage-tube.*—Michael F., aged six years; admitted February 6, 1878. Service of Dr. Keen. Two years ago he began to have pain in the right knee, and a slight limp when he walked. About three months ago there was first noticed a swelling in right thigh, which increased slowly, and was not very painful. General health not much affected. When admitted his general appearance was fair, appetite good, and he slept well. A large swelling involved the upper two-thirds of right thigh, and was tense and fluctuating. Right thigh measured in circumference  $14\frac{1}{2}$  inches, left  $9\frac{1}{2}$  inches; pelvis tipped forwards.

7th. Swelling opened, two incisions being made, one on outer, and other on inner aspect of thigh, and about sixteen ounces of pus discharged, and a drainage-tube inserted. Part was dressed antiseptically, no constitutional disturbance followed, and his general health improved. Dressing continued until March 1, when poultices were applied. Openings discharged a small quantity of pus, and hip was enlarged and somewhat hard.

June 10. Service of Dr. Grove. To this date poultices have been used. The two incisions made Feb. 7 not closed, but discharge a small quantity of watery pus. Hip enlarged and hard. General health improved under the use of cod-liver oil and iron. Leg could be moved backwards and forwards without much if any pain, but, when abducted, there were pain and considerable stiffness and crepitation was felt in hip-joint. The sinuses could not be traced into the joint. Under ether an operation, the same as for Case No. IV., was performed. Head of femur was found carious; lower half completely denuded of cartilage; upper half covered by cartilage, which was roughened, and barely attached to neck at epiphysis. Neck and trochanters carious; the bone was sawn off below lesser trochanter; about two and a half inches of bone removed. Acetabulum not diseased. Two drainage-tubes were inserted; wound closed by iron-wire sutures, and antiseptic dressing applied. He suffered very little from shock after operation, but had a good deal of pain, for which morph. sulph. gr.  $\frac{1}{4}$ , was given hypodermically. Temp. normal.

11th. Rested well during the night, and suffered now very little pain. Ordered milk and beef-tea, and whiskey  $\mathfrak{z}$ ss every four hours. Dressing was changed, and part looked well. Morning temp.  $98\frac{3}{4}^{\circ}$ ; evening temp.  $99\frac{1}{2}^{\circ}$ . Prescribed quiniæ sulphat. gr. j every two hours.

12th. Morning temp.  $99^{\circ}$ , evening temp.  $99\frac{1}{2}^{\circ}$ .

13th. When dressing was removed a slight blush was noticed about incision, and a few drops of pus were found on dressing. Had very little pain, and took nourishment well. Morning temp.  $100^{\circ}$ , evening temp.  $103^{\circ}$ .

14th. Morning temp.  $99\frac{1}{2}^{\circ}$ , evening temp.  $101^{\circ}$ .

15th. All redness has disappeared, and about one drachm of healthy pus discharged. Morning temp.  $98\frac{3}{4}^{\circ}$ , evening temp.  $99\frac{1}{2}^{\circ}$ .

17th. Drainage-tube removed, and about two drachms of healthy pus discharged during twenty-four hours. Temp. to date has not been above normal; general health much improved.

20th. Sutures removed, and wound united by first intention, except where drainage-tube had been.

July 1. Pus, since the 17th, not sufficient to saturate the dressings for three days. Temp. normal.

10th. Splints removed.

20th. Antiseptic dressing discontinued. A small amount of pus is still discharging from the one opening.

25th. Could walk about the wards with a cane.

Sept. 15. Motion of leg good, and can bear his weight on the leg. General health very much improved. There was a sinus in line of first incision, at bottom of which a fragment of dead bone could be felt. He was taken to his home.

CASE VI. *Compound Comminuted Fracture of the Ulna; Insufficient Antiseptic Precautions and Drainage at Outset; Fever abating on remedying Errors; Recovering with slight Suppuration for so severe an*

*Injury, and without Necrosis.*—Harry A., aged 18, admitted February 11, 1878. Service of Dr. Keen. Suffering from a compound comminuted fracture of right ulna, caused by a circular saw. Upper fragment of ulna projected a rough, ragged edge from wound, and soft parts were very much lacerated for three-quarters of the forearm; bleeding was slight, and no vessels were tied. All pieces of bone were removed, and the wound carefully washed with  $2\frac{1}{2}$  per cent. solution of carbolic acid, and parts approximated with catgut sutures; no drainage tube was used. Antiseptic dressing applied, and arm supported with an internal angular splint and a straight splint for outer surface of forearm.

12th. Did not sleep well, but did not suffer much pain. A few drops of pus discharged. Temp.  $101^{\circ}$ .

13th. Temp.  $103^{\circ}$  in the evening, and he was very restless.

14th. First seen by Dr. Keen. Bad odor from wound, and about a tablespoonful of pus discharged. One suture removed, and the part washed with solution of chloride of zinc (gr. xl-5j), and a drainage-tube inserted; slight blush above wound, reaching to the elbow-joint. Temp.  $101^{\circ}$ .

17th. Since last date temperature has been normal; sutures gave way, and the parts separated, exposing the bone. Drainage-tube was removed as drainage was now free. About a tablespoonful of healthy pus discharged during twenty-four hours; no odor about wound; redness disappeared, and wound looked perfectly healthy.

20th. Wound was granulating, and bone almost covered; no pain; appetite good, and slept well. Amount of pus very much diminished; dressing was continued until March 6th, when wound had almost closed, a small granulating surface remaining.

March 13. Discharged with good motion in fingers and elbow-joint. No necrosis ever occurred.

CASE VII. *Compound Fracture of Frontal Bone; Bone denuded and not healing under ordinary Treatment; Rapid Healing without Necrosis under Antiseptic Dressings.*—Isabella L., admitted September 25, 1878. Service of Dr. Mears. Suffering from fracture of frontal bone, caused by blow on head with a pitcher. An incised wound was found about  $1\frac{1}{2}$  inch in length in left frontal region, just anterior to coronal suture; at bottom of which could be felt a fracture of bone, lines of fracture radiating in various directions; no depression of bone and no symptoms of compression of brain. Wound was closed with iron-wire sutures, and cold-water dressing applied. Did well until fourth day, when parts about wound became red and swollen; redness and swelling extending to the level of ear; sutures were removed, and a small quantity of watery pus discharged; and at bottom of wound the bone could be seen completely denuded of its periosteum, about 1 by  $1\frac{1}{2}$  inches, being in this condition. Temp. was  $101^{\circ}$ . In about three days all redness and swelling disappeared, and temp. was normal.

Oct. 10. Service of Dr. Keen. Bone still further denuded, and wound shows no tendency to healthy granulation. The part was washed out with 5 per cent. solution and antiseptic dressing applied.

16th. Granulations have covered half-denuded bone, and only a few drops of healthy pus discharged.

20th. Granulations completely filled the wound, and cicatrization commenced.

23d. Dressing continued.

Nov. 1. Discharged. Wound nearly all healed.

CASE VIII. *Scirrhus of Breast; Amputation; Temperature under 100°; Return of Disease; Reamputation three months after First; Temperature as a rule not over 100°; Slight Suppuration; Final Return of Disease.*—Bridget Q., aged 51, admitted April 29, 1878. Service of Dr. Grove. When first seen she was rather pale; general health was good. A tumour about size of fist occupied left mammary gland, projecting about half an inch above the healthy tissue; it was hard and red, almost purplish, and veins of breast and surrounding tissue enlarged; and was the seat of occasional sharp shooting pains. There was no glandular involvement.

May 2. Two curved incisions were made, and whole breast removed, including unhealthy skin covering the tumour. Four vessels were tied by carbolized catgut. The parts were approximated by silver-wire sutures, two drainage-tubes were inserted, and antiseptic dressing applied. Suffered very little from shock, but required morphia gr.  $\frac{1}{4}$  hypodermically for pain. Ordered milk and beef-tea.

3d. Slept well, and had no pain, but feeling of soreness in part; dressings saturated with the bloody oozing, and were changed. Temp. 99°.

8th. To date has been dressed every day. About two teaspoonfuls of discharge during the day. The temp. has not reached 100°.

10th. Slight inflammation of surface above the incision, which reached to clavicle; this was painted with tincture iodine, and antiseptic dressing continued; about same amount of discharge as at last date. She felt a little restless, and quiniæ sulphat. grs. ij, was given every two hours.

12th. All redness disappeared; slept well, and has no pain; sutures removed, and the wound united by first intention, except about three-quarters of an inch in the centre of the wound. Temp. 99°.

21st. Wound dressed every third day. It has all healed, except a small granulating surface as large as a quarter dollar. General health much improved. To date temperature has been normal.

June 1. Antiseptic dressing discontinued.

12th. Discharged. A small granulating surface remained as large as ball of thumb, which looked perfectly healthy, but was indolent. Diagnosis, cystic sarcoma.

Aug. 13. Readmitted. Service of Dr. Mears. The open surface remained the same for about three weeks, when it began to pain, and in a few days the edges became hard and began to grow, filling up the opening, and were soon above the surface of skin. When readmitted, there was a fungous mass, as large as the fist, and parts around were hard, red, and painful. The growth was the seat of sharp, shooting pains, frequent hemorrhage, and gave off the most offensive odor and sanious, irritating pus; no glands were found enlarged, appearance very cachectic, appetite poor; could not sleep well, and was rapidly being worn out by constant discharge and pain.

25th. Two incisions were made, including the whole of the diseased structure; pectoralis major, just beneath tumour, was found diseased, and this part was also removed; the removal of the tumour left an open space to ribs, extending from sternum to axilla, and about four inches wide. Six vessels were tied, and the wound drawn together as well as possible by carbolized silk sutures, but left a space almost as large as the hand. A large antiseptic dressing was applied. She suffered much from shock, and required strong stimulation. Whiskey  $\mathfrak{ss}$  every two hours, milk, and beef-tea were ordered.

26th. Dressing changed, and parts looked well. Temp.  $100^{\circ}$ . Quinia sulphat. grs. ij, every two hours, ordered.

31st. Surface granulating, and commencing to cicatrize; sutures removed, and wound gaped a little. The temp. has ranged from  $99^{\circ}$  to  $101^{\circ}$ , but, as a rule, not above  $100^{\circ}$ . Improving in strength and appetite.

Sept. 9. To date the dressing changed every day, and the temperature has been normal. About a tablespoonful of healthy pus discharged daily. Granulations have filled the wound completely, and cicatrization is going on rapidly.

15th. A granulating surface remains as large as the palm of the hand.

Oct. 5. Dressing discontinued; the surface was as large as half the palm of the hand.

19th. Service of Dr. Keen. Two suspicious looking buds of granulations were removed. The parts looked well for about two weeks, when again their soft fungous masses began to appear and were again removed, and in lower and outer part a mass of diseased tissue, about size of a walnut, was found beneath the skin (which was not diseased), and this was also removed.

22d. The disease has commenced to return again, and, as the case was considered hopeless, she was removed to her home.

CASE IX. *Scirrhus of both Breasts; Consecutive Amputations seven weeks apart; Two Modes of applying deep Supporting Sutures or Guys; After First Amputation Hemorrhage and Decomposition of Clots, but no Fever; After Second, Fever by Error of Dressing.*—Ann S., aged 42; admitted September 28, 1878; service of Dr. Mears. About two years ago she first noticed a small lump, about the size of a hickory nut, behind the right nipple, which continued to grow larger, but was not painful, except on pressure, until six months ago, when it ulcerated, discharging foul sanious pus of an offensive odour, and became the seat of short, shooting pains. A short time after the tumour in the breast was noticed a smaller one was felt in anterior part of axillary space, on border of great pectoral muscle. The general appearance cachectic, but had good appetite and slept well. The whole right breast hard, somewhat nodular, and presented an eaten appearance and discharged offensive, ichorous pus. At anterior part of axilla was a lump as large as a walnut.

Oct. 1. Two curved incisions were made, including all the diseased structure, and whole gland removed. Enlarged gland in axilla dissected out. Bleeding quite profuse; seven vessels were tied and wound drawn together in this way: a needle armed with a silk thread was passed through tissues about  $\frac{3}{4}$  inch from edge of wound, from without inwards, and then carried to other edge and passed through from within outwards, about same distance from edge of wound; a harelip pin was then passed through the skin where the needle had entered and also where it emerged, and the thread was drawn up tightly and wound around these pins; then outside a thread was wound between the pins. By this means the wound could be drawn together, leaving not more than three inches which were not covered by skin. Drainage-tube placed in axilla and antiseptic dressing applied. In about an hour after dressing was applied the part was found bleeding, but this was controlled without much difficulty by pressure. Reacted well from operation, but felt weak from loss of blood. Stimulants were given, and as she was very restless, gr.  $\frac{1}{4}$  of morphia was given hypodermically.

2d. The dressings saturated with blood and surface of the wound covered

with clotted blood, of which only that which could readily be washed away was removed. Temp. normal.

4th. To date temp. normal and the part dressed each day. Slept well and had good appetite. There was a disagreeable odour about the part, the blood-clots evidently having taken on putrefaction. Temp.  $99\frac{1}{2}^{\circ}$ . The part was carefully washed with the 5 per cent. solution.

6th. All odour disappeared from part; surface granulating and commencing to cicatrize. Pus discharged was about  $\frac{3}{4}$ ij for twenty-four hours. Temp. normal.

8th. Sutures and pins removed; wound did not gape; drainage-tube also removed.

19th. Dressing not changed for four days, and no odour whatever observed; part is healing rapidly.

26th. The amount of pus has not been sufficient to reach the edge of dressing for a week; no odour; a perfectly healthy granulating wound remained as large as a half dollar.

Nor. 1. Antiseptic dressing discontinued; small surface remains which has not healed, but is healthy looking.

22d. Service of Dr. Keen. A few days after operation of October 1st a few small hard nodules were felt in left breast; these were painful on pressure, but gave no other inconvenience. About a week ago the breast was again carefully examined and a hard lump was felt behind nipple deep in breast. The open surface remaining from the other operation was very small. It was thought best to remove the breast. Two incisions were made, including the skin containing the nodules and the nipple, and the whole breast removed. Three vessels were tied. Wound drawn together in this way: a needle armed with silver wire was passed through the tissues about one inch from edge of wound, and passed out on other side about same distance from edge of opening. Upon each end was slipped a bead of glass  $\frac{5}{16}$  of an inch in diameter; the beads were brought down to the skin, and each end of the wire wound around a piece of match, drawing upon the wire to make it tight. Two of these deep sutures were used, and the edges of wound were then approximated with iron-wire sutures. A drainage tube was placed in wound extending whole length of incision; salicylic cotton was placed over end of the drainage tube and antiseptic gauze applied. Reacted well. Morphia gr.  $\frac{1}{4}$ , hypodermically given. Temp.  $99^{\circ}$ .

23d. Did not sleep well and did not care for nourishment. Dressing changed and considerable bloody serum came from the drainage-tube. A. M., temp.  $101\frac{3}{5}^{\circ}$ . P. M., temp.  $102\frac{2}{5}^{\circ}$ . Suffered considerable pain all day.

24th. Still restless, but slept some during the night. A few drops of pus were found on the dressing. A. M., temp.  $100.5^{\circ}$ . P. M., temp.  $98^{\circ}$ .

25th. Temp.  $99\frac{4}{5}^{\circ}$ . Appetite good.

26th. Guys removed and about  $\frac{1}{2}$  inch of the drainage-tube removed. P. M., temp.  $100\frac{3}{5}^{\circ}$ .

28th. About  $\frac{5}{8}$ ss of pus pressed from wound. A. M., temp.  $101.5^{\circ}$ . P. M., temp.  $101\frac{2}{5}^{\circ}$ . It was found that by accident ordinary cotton had been placed over drainage-tube in place of antiseptic cotton, at least once and perhaps oftener.

29th. A. M., temp.  $100.5^{\circ}$ . P. M., temp.  $100^{\circ}$ . Sutures all removed and about 1 inch of wound found not united.

Dec. 5. To date temp. normal. The parts dressed every second and

third day and the discharge of healthy pus very small. Appetite good, sleeps well, and general health improved. Several glands in right axilla were to-day found enlarged, and one in left.

15th. Dressing continued to date, when the part was all healed. The open surface of right side remaining from the last operation became larger, but is now healing under use of a solution of tartrate of iron and potassa.

CASE X. *Necrosis of Sternum and First Rib; Resection; Temporary Fever; Union by First Intention without Suppuration.*—Jacob S., aged 66; admitted October 28, 1878; service of Dr. Keen. About eight months ago he first noticed a swelling over upper part of sternum, about level of first rib; this increased slowly, became red and fluctuating, and in about three months opened spontaneously and discharged a small quantity of pus. When admitted there were three sinuses, one above clavicle and two over upper part of sternum, which discharged a small quantity of pus. Probing these, dead bone could be felt. The parts around were hard, enlarged, and red, but not very painful.

Nov. 2. An  $\pm$  incision was made from left sterno-clavicular articulation to second interspace, exposing freely the diseased bone. About  $\frac{3}{4}$  inch of first rib was found diseased, and a portion of sternum as large as a silver dollar, and was removed piecemeal by the double-gouge forceps. Wound washed out with  $2\frac{1}{2}$  per cent. solution of carbolic acid, a drainage tube inserted, and parts closed by iron-wire sutures. The gauze prepared with thymol applied. Suffered some pain after operation, and was given morphia gr.  $\frac{1}{4}$  by mouth. Temp. normal.

3d. Slept well and has no pain; dressings saturated with bloody serum and were changed. Temp.  $101\frac{1}{2}^{\circ}$ .

4th. Slept well; no pain; dressing changed. Temp. reached  $102^{\circ}$ .

5th. Did not sleep very well; dressing changed, but no pus found; parts look well. Temp.  $100\frac{2}{3}^{\circ}$ .

6th. Sutures removed and the parts united by first intention, except where the drainage-tube was placed. Temp. normal.

8th. To date temp. normal. Drainage-tube removed; a few drops of pus.

14th. To date parts dressed every second day, and temp. normal. The redness and enlargement have all disappeared; the dressing discontinued. One large sinus remains where the drainage-tube had been, and discharges a small quantity of pus. This was packed with lint.

28th. Sinus remains, but is rapidly becoming smaller by filling up from bottom; general health very much improved. In this case the gauze was prepared with the thymol, but the carbolic acid solutions were used for washing and for the spray.

REMARKS. I. *Dressing.* (a) *Gauze.*—The gauze used is prepared in the hospital, and is much softer and can be more easily adapted to any irregularity of the part than any purchased, except the imported article; being softer, it absorbs the discharge before it can reach the edge of the dressing, as it is very apt to do if the gauze is very stiff by passing between the skin and the dressing. It is prepared in this way: For fifty yards of the gauze take paraffine,  $\mathfrak{Fv}$ ; resin,  $\mathfrak{Fivss}$ ; carbolic acid,  $\mathfrak{Fjss}$ ; and about  $\mathfrak{Fij}$  of alcohol, and mix them by heat. Six drachms of carbolic acid are added to two gallons of water and the mixture brought to a boiling point. The whole of the gauze is first passed through the watery solu-

tion of carbolic acid, and then through the first mixture which is boiling, and immediately after it through a clothes wringer; it is then placed on a line to dry, and when dry sprinkled with a solution of carbolic acid (3ss to Oij), smoothed out with the hands and folded into the eight layers, and is then ready for use. Prepared in this way it costs  $4\frac{1}{8}$  cents per yard without the labour.

(b) *Protective*.—The protective is also prepared in the house from oiled silk in the ordinary way,<sup>1</sup> and is of the same colour as the oiled silk, not green as is the imported article. Its lighter colour gives it an advantage over the imported, for the change of colour to black which the smallest amount of septic material in the part causes can more easily be seen.

(c) *Bandages*.—The bandages are the ordinary muslin roller, and not prepared with carbolic acid as directed by Prof Lister.

(d) *Drainage*.—Both the rubber tubing and the horse hair have been tried for drainage, and the horse hair found particularly serviceable, as it allows of closer approximation of the parts, a perfect drainage, and as the discharge diminishes the hair can be removed, a few strands at each dressing until the part has healed; but when the discharge may be expected to be large, the rubber tubing answers a better purpose. The importance of free drainage is seen in Case I.; a drainage-tube should have been passed antero-posteriorly from the incisions through the leg immediately after the operation, and the neglect to do this will account for the increase of temperature on the eighth day, which immediately became normal after free drainage was established. The fact too that eleven days after the operation this pent-up discharge was bloody serum and not pus is most noticeable.

(e) *Time*.—The trouble and time required in the use of this method may be deemed by some an objection, but when we consider the fact that, after the first few days at most, the dressing remains two or three days, and sometimes even a week without being removed; we have found that while the time occupied for any one dressing is slightly more, it is in the sum total less than with the ordinary treatment; and the advantage of the dressing's not being removed for a number of days is not only in the time and trouble saved, but the freedom of the patient from the pain and annoyance of frequent dressing and the perfect rest allowed the part.

(f) *Atomizer*.—The spray apparatus first used was the ordinary throat atomizer which answered the purpose admirably, and for all operations that do not require too long a time, or extend over too great a surface, this will do as well as the more expensive ones. It is easily prepared by replacing the shield-stand and medicine cup, by a 5iv bottle, and using a large atomizing tube with a rubber tube attached to reach to the bottom of the bottle. The spray apparatus now in use is that of Dr. R. F. Weir, of

<sup>1</sup> First coated with copal varnish on each side, and then with a mixture of dextrine 1 part, starch 2 parts, and of a 5 per cent. solution of carbolic acid and water, 16 parts.



New York, and costs fifteen dollars; it throws a large spray and is very convenient and durable.

We have tried the apparatus of Dr. Heuel for conducting the spray away from the rest of the apparatus by a rubber tube seven feet long, and while we have found it very convenient, as it is light, and the spray can be thrown in any direction, and it does away with all danger of the ether's taking fire from the lamp, yet we have been annoyed by the bursting of the tube conducting the steam. This has now been remedied by having a layer of cloth placed in the tubing as suggested by Dr. Keen.

(g) *Mackintosh*.—In place of the Mackintosh we have tried oiled silk, oiled muslin, gutta-percha tissue, waxed paper, and paraffine paper. The paraffine paper and the waxed paper, worth about one cent a sheet, 36 by 24 inches, will not answer well, as they are permeated by the discharges. The oiled silk at \$1.50 per yard meets every indication. The oiled muslin at 75 cents per yard is also a very good substitute, but is a little stiff if the surface is uneven. The gutta-percha tissue at 60 cents per yard answers every purpose as well as the Mackintosh or oiled silk, while it is much cheaper; its transparency and flexibility are advantages as the condition of the dressing can be seen through it, and it can be fitted easily to any part. Dr. Keen has lately suggested that paraffine paper can be prepared with rubber to avoid both absorption of discharge and to increase the impermeability and the toughness of the paper. But our experience with it is as yet too limited to pronounce an opinion.

(h) *Errors*.—We have made several, and have frankly stated them. Such errors were due chiefly to inexperience in the details of a new dressing requiring care. Probably the slight suppuration occurring in several of the cases was due to errors from the same cause; but granting that it was, it was incomparably less than generally follows in similar cases, and in most of them was simply a few drops.

II. *Results*.—The absence of fever has been marked. Most of the cases reported were severe operations, yet the fever was usually ephemeral, and not at all of the severe grade of more or less prolonged surgical fever so commonly seen in such cases. Of course without the antiseptic precautions many cases recover without much fever, but the *rule* is that they *do* so suffer. In our present experience with antiseptic precautions the rule is that they *do not* for any length of time. There has been but one case of erysipelas in the wards since the method was introduced, and in this case (a severe scalp wound) the erysipelas appeared before the antiseptic dressing was applied, and advanced Bright's disease soon destroyed life by coma and convulsions. The perfect cleanliness, as everything used is washed carefully with carbolic acid, may have much to do with the absence of erysipelas, fever, and other complications, yet can scarcely account for all the good results obtained. No cases of pyæmia except the following supposed case has occurred. This at the time was thought to be a failure of

Listerism, but it was afterwards discovered that there had been a mistake in the solutions; in place of the strong solution (gr. xxiv to  $\bar{3}j$ ), gr. vj, and for the weak (gr. xij to  $\bar{3}j$ ), gr. iij had been used.

CASE XI. *Strumous Abscess; Error in Dressing; Death possibly from Pyæmia.*—Pat. K., aged 33, was admitted May 28, 1878, service of Dr. Grove, suffering from a strumous abscess of right gluteal region, of seven months' duration. The abscess extended from first lumbar vertebra to a short distance below great trochanter, and from anterior spine of ilium to within an inch of the anus. Aspiration was tried, but the pus would not flow, as it contained masses of broken-down lymph which immediately stopped up the tube.

Jan. 14. A free opening was made by side of lumbar vertebræ, and more than a quart of pus, containing great masses of cheesy dead tissue, was discharged; no constitutional disturbance whatever until midnight of 15th, when he was taken with rigor and vomiting.

16th. Cold, almost pulseless, covered with cold perspiration, and rapidly sinking. He vomited almost constantly, had great thirst and pain in abscess. That decomposition had taken place in the sac, could be seen from the fact that it contained gases, which gave a crackling sound when the part was pressed upon, and could be pressed from the opening in bubbles. The pulse was thin and sanious. Notwithstanding stimulation by mouth and rectum with whiskey and ammonia, and quinia given in large doses, and the sac washed out with the supposed 5 per cent. solution of carbolic acid, and afterwards with the solution of chloride of zinc (gr. xl to  $\bar{3}j$ ), he continued vomiting until 4 P. M. of the 17th, when he died. No post-mortem could be made.

We cannot say that Listerism properly carried out would have saved this man's life, nor do we think this can at all be considered a fair trial of the treatment in this class of cases. No death has occurred in the ward under this treatment, except a case of cholecystotomy which has been reported by Dr. Keen separately (see number of this Journal for January, 1878, page 134), which resulted fatally not from failure of this treatment, but from shock and hemorrhage.

*Recovery.*—The time before recovery is completed for a given number of cases is shorter as the complications that so often retard recovery, especially in crowded hospital wards, are in a great measure avoided; and this fact allows of operations, which under ordinary circumstances would not be justifiable. Case I. was really a bad compound fracture of the ankle-joint with serious and extensive injury to the soft parts, yet the constitutional disturbance was very slight and accounted for by the error of drainage.

*Wards.*—There has been a marked improvement in the wards since the introduction of this treatment, as the finely divided carbolic acid that is thrown into the air by the atomizer during the dressings thoroughly disinfects them and does away with all odour and makes them neat and clean. For disinfection the atomizer has also been carried through the medical wards, and we have found it to be a convenient and certain method of disinfection.

## ARTICLE IX.

COMPLETION OF THE HISTORY OF A SUCCESSFUL CASE OF PARACENTESIS OF THE PERICARDIUM. By WILLIAM PEPPER, A.M., M.D. (Univ. of Penna.), Prof of Clinical Medicine in the University of Pennsylvania.

IN the number of the *Medical News and Library* for March, 1878, I published a clinical lecture on Paracentesis of the Pericardium, which contains the report of a case occurring in the practice of Dr. G. A. Rex, in which I performed this operation. The patient was an apparently healthy girl of 17 years old, who, without known cause, developed pericarditis with extensive effusion. There was alarming disturbance of respiration and circulation, with epileptiform convulsions. The urine was slightly albuminous, and hyaline tube casts were found. On the evening of September 11, 1877, when paracentesis of the pericardium was performed, she was evidently moribund. The puncture was made in the fifth intercostal space, about one inch inside of the line of the left nipple, *i. e.*, nearly in the normal position of the apex-beat, and over eight fluid-ounces of reddish serum were removed. Immediately following the operation, the urgency of the dyspnœa and cardiac embarrassment was relieved. The patient slowly improved, and in the course of a month was able to spend the day out of bed, and to walk about slowly. There was no return of pericardial effusion, and the heart's action steadily improved. Albumen disappeared from the urine, and tube casts could no longer be found. About three and a half months after the operation plastic pleurisy occurred on both sides of the chest, and this was followed by ascites, evidently connected with subacute peritonitis. There was no evidence of any tuberculous affection of the lungs. There was no hereditary diathesis of either a tuberculous or syphilitic character, yet it was evident that there existed a constitutional tendency to slow inflammatory affections of all the serous membranes successively. In that report the history of the case was brought down to February, 1878, at which time it might safely be said that, as far as the original disease and the operation were concerned, the result had been completely successful. But there was still considerable ascites, although it seemed likely to yield to the use of an exclusive milk diet, and full doses of iodide of potassium. Through the kindness of Dr. Rex I am now able to supply the subsequent history of the case from February, 1878, down to December 12, 1878, the date of her death, as well as to give the results of the post-mortem examination.

Under the continued use of iodide of potassium and digitalis, with the occasional use of small doses of bichloride of mercury, the ascites almost entirely disappeared. The appetite was capricious and poor; but there was a gain in strength, so that she was able to be up all day, to walk up and down stairs, and, during the summer, to pay a visit of several weeks to the country. There was no return of cardiac or pulmonary disturbance,

though the pulse remained frequent and small. Albuminuria did not recur, and there was no return of convulsions. The ascites fluctuated, at times increasing, and again diminishing. For some weeks previous to her death it had been considerable. On the evening of her death she had seemed as well as usual, and went up stairs, undressed herself, and lay down in bed, when almost instantly she made several hurried exclamations, had some irregular spasmodic contractions about the face and arms, and died in a few moments.

The *post-mortem* examination was made under some difficulties, so that thorough investigation was not possible. The head was not examined. On opening the abdomen the lower part was found occupied by an extensive effusion. The intestines were floated upwards. There were few if any signs of inflammation of the intestinal peritoneum, but marked changes were observed in the parietal peritoneum and in the capsules of the liver and spleen. The peritonitis was most marked in the upper segment of the abdomen, where the parietal membrane presented large patches of irregular thickening. No tubercles were found on any part of the peritoneum. The capsules of the liver and spleen were greatly thickened, whitish, opaque, and densely fibrous. The liver was enlarged and heavy, and so tightly bound by its thickened capsule that its shape was somewhat altered. On section it was dark coloured, and showed nutmeg congestion.

The spleen was enlarged, congested, and slightly softened. The kidneys were unusually adherent to their surroundings, were slightly enlarged and heavy, and presented slight irregularities in shape, due to shallow curving depressions of their surface. The capsule was very slightly thickened, but could be stripped off without removing any portions of the cortex. The tissue was too dense and hard, and the entire organ was much congested. Microscopical examination showed a slight degree of interstitial nephritis, the capsules of the Malpighian bodies being thickened, and the intertubular connective tissue slightly increased. The stomach and intestines were apparently healthy. The mesenteric glands were not enlarged.

The diaphragm, especially that part of it underlying the pericardial sac, had undergone marked fibroid degeneration. The muscular tissue was much atrophied, many fasciculi had evidently disappeared, while many others were markedly narrowed, some of them shading off to a width of less than  $\frac{1}{300}$ th of an inch, and finally disappearing altogether. They retained, however, even in their narrowest dimensions, their transverse striæ.

On opening the thorax the cellular attachments of the sternum all along the anterior mediastinum were unusually close and resisting. The pericardial sac was closely applied to the body of the heart, which occupied its normal position. All around it there was marked thickening and fibroid change in the cellular tissue and adjacent serous membranes.

No trace of the puncture could be found. On cutting through the pericardium the sac was found completely obliterated by close and universal adhesions. The visceral layer was somewhat thickened, and presented numerous small nodular roughnesses. The reflected layer was about one-fifth of an inch thick, and composed of dense fibrous tissue. The diaphragmatic portion was particularly thick, and was blended with the altered fibroid structure of the muscle. The heart was of normal size. There was no disease of any of its valves. The walls of the right ventricle were decidedly thinner than natural. The other walls were of average

thickness. Microscopic examination showed marked fatty degeneration, the muscular fasciculi being granular, while their transverse markings had disappeared. There was no ante-mortem clot.

The lungs were extremely congested and oedematous, dark in colour and heavy, although crepitant. There was no tuberculous or caseous formation. The pleural membranes on both sides were thickened and adherent throughout. The thickening was considerable all over, but was especially great over the anterior borders, and the mediastinal surfaces of the lungs. Here the amount of fibroid thickening was so great that, in conjunction with the condensation of the mediastinal cellular tissue, the pericardial thickening, and the transformation of the diaphragm, it caused an accumulation of new-formed fibrous tissue almost like a morbid growth occupying the anterior mediastinum. The microscopic examination of the above specimens was made by Prof. James Tyson.

*Remarks.*—It is now possible to estimate fairly the effects of the operation of paracentesis of the pericardium in this case. It is evident that the needle entered the lower left angle of the sac, and thus was in the most favorable position for draining its cavity. As far as the operation itself was concerned also, it was clearly a perfect success, since the liquid did not return, and complete obliteration of the pericardial sac occurred. It would appear, therefore, as though life might have been indefinitely prolonged in considerable comfort had it not been for the progressive implication of the various other serous membranes. As it was, life was prolonged fifteen months, after the first of which time little annoyance was experienced from disturbance of the heart's action. It will be noted, however, that while the muscle of the diaphragm had undergone atrophy with fibroid change, evidently from extension of disease from the investing serous membranes, the muscular tissue of the heart had undergone advanced fatty degeneration. It is a well-known fact that this organ presents a peculiar tendency to this change, although the diaphragm not rarely undergoes a similar degeneration. Among the causes of fatty degeneration of the heart adherent pericardium must be included, though it is always a matter of doubt how far the change in the muscular tissue is due to the interference with its nutrition caused by the adhesions, and how far to the influence of a true myocarditis, occurring simultaneously with the pericarditis. In the present case it seems that a large share must be attributed to this latter cause.

It does not often happen that one can be, during life, as sure of the existence of adherent pericardium as in this instance, and therefore it should have been a very favourable chance to study the physical signs which are thought to be diagnostic of this condition. But, in fact, they were entirely absent. The impulse of the heart was diffused and feeble, and unattended with thrill. There was no recession of the intercostal tissues during the ventricular systole, nor any diastolic collapse of the jugular veins, nor recession of the epigastrium. And this was the case, despite the fact that there existed those external adhesions between the pericardium

and the chest walls in front, which seem in some cases to render the above-mentioned signs of pericardial adhesions more evident. This case must be regarded as another illustration of the fact that while, when these signs are present, the existence of adherent pericardium may be assumed with great probability, they may all be absent in cases of complete adhesion.

The condition of the kidneys was very interesting as bearing on the nature of the convulsions which occurred during the stage of acute illness preceding the operation. It will be recalled that for some months previously she had noticed increasing dyspnœa, and had been obliged to pass urine more frequently than usual, which, on September 9, 1877, contained a slight trace of albumen with a few hyaline or granulo-hyaline tube casts. On October 15th, however, thirty-three days after the operation, in which interval the urgent symptoms of disturbance of circulation and respiration had passed away, the urine no longer contained even a trace. It seemed probable that the albuminuria was secondary and dependent on the long-continued and marked disturbance of the action of the heart and lungs. When the latter became intense there was an increase in the renal congestion, and for the time the interference with the secretion of urine caused severe symptoms, and added greatly to the gravity of the condition. Although, after relief was afforded to the circulation by the withdrawal of the pericardial effusion, the albuminuria disappeared, it appears that there remained a certain degree of irritation and congestion of the kidneys which ultimately led to slight hyperplasia of the interstitial connective tissue. In short, the condition of the kidneys was such as is frequently seen in connection with and dependent on organic disease of the heart. It is not possible then to regard the wide-spread, almost universal, affection of the serous membranes as in any way consequent upon chronic kidney disease, nor does it seem possible to determine what was the essential cause and intimate nature of this affection. It was not attended with the formation of either tubercles or cancer. The parents were healthy, the father never having had syphilis. The patient herself presented no evidence of inherited syphilis, and certainly had not acquired the disease. In its insidious development, its essentially chronic, non-febrile course, and in the progressive implication of the various serous membranes, the affection was more closely allied to a degenerative process than to a simple inflammation. There was no history of antecedent acute disease (except an attack of measles in early childhood); and the only influence which can be assigned as having part in the production of the disease was her exposure to draughts which blew on her while at work. It would seem that there must have been some constitutional tendency to this type of disease of the serous membranes, which required only the action of ordinary causes to call it into activity. As the liability to such progressive disease could not have been foreseen, the operation was certainly imperatively demanded; and, as already said, its results were entirely satisfactory, since the effusion was safely

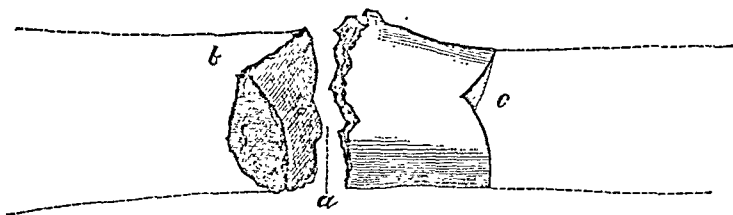
removed, the impending death was averted, and there was no return of pericardial effusion, and no injurious effects whatever from the operation itself.

#### ARTICLE X.

UNUNITED FRACTURE OF THE HUMERUS SUCCESSFULLY TREATED BY DOUBLE SPlice AND CLAMP. By F. LE MOYNE, M.D., Surgeon to the Western Pennsylvania Hospital, Pittsburgh, Pa.

ALEXANDER F—, 34 years of age, was born in Scotland. He is a cutter of clothing, has always enjoyed good health, and could furnish no history of specific disease or constitutional defect. On July 13, 1877, while riding in a car of the A. V. R. R. with his elbow projecting from the window, he was struck by a post, causing a simple fracture of the humerus. He received prompt surgical attention. On the 26th of August, 1877, the arm was dressed with plaster of Paris, which was continued for several weeks, and followed by silicate of soda and ordinary splints. He was admitted to the Western Pennsylvania Hospital March 20, 1878, and on the 27th Brainard's drills were used. On May 15, 1878, three ivory pins were inserted into the ends of the bone, and on July 10th the fragments were redrilled. All these measures failed to produce union, and on Oct. 1, 1878, the arm was almost useless, and the man so anxious for relief, and determined to persevere as long as any hope of success remained, that I resolved to make another effort. Upon external examination the fragments seemed partially in apposition, but very movable. The fracture was found to have occurred near the junction of the middle and lower thirds. The upper end of the lower fragment could be distinctly felt, and seemed to be drawn forward by the brachialis anticus and the flexor muscles of the forearm and hand. On the 23d of October, 1878, having the patient well anæsthetized, I exposed the fracture by a free longitudinal incision through the anterior aspect of the arm. No fragments of ivory, or other traces of former operations, were discovered, except some induration of the connective and muscular tissues.

Fig. 1.



The method of connection was principally fibrous, but an articular surface, Fig. 1, *a*, about one-fourth of an inch in diameter, existed, having a synovial membrane. With very little loss of tissue, the upper end of the lower fragment was formed into a V-shaped groove, running antero-posteriorly, and removing a wedge-shaped fragment, Fig. 1, *b*. The extremity

of the upper fragment being somewhat excavated, a greater loss of bone was necessitated. It was first sawn transversely on a level with the most receding portion of the excavation, making a plain perpendicular section of the bone. Then two sections were made, respectively, from the external and internal aspects of the shaft of the bone, each beginning one-fourth of an inch from its extremity and terminating at its centre, removing a V, Fig. 1, *c*, and leaving a wedge to fit into the V of the lower fragment. In anticipation of the operation, a steel wire clamp, Fig. 2, bent upon itself at right angles at each end, and a brass plate, with perforations to correspond with the ends of the clamp, had been prepared.

Fig. 2.

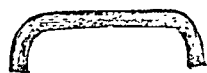
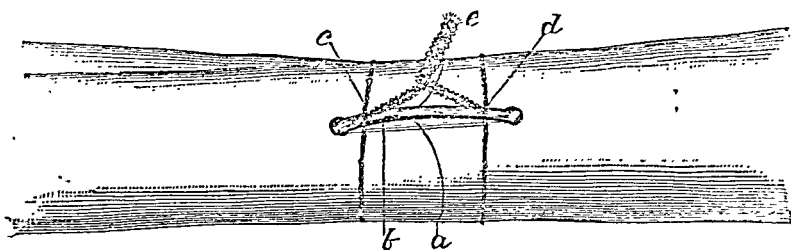


Fig. 3.



The prepared extremities were brought into accurate apposition, Fig. 3, *a*, a hole drilled in the lower fragment, the plate adjusted, and the second hole drilled through the plate. The plate was then removed and the clamp applied, Fig. 3, *b*, seeming to hold the fragments firmly in position. Splints were applied and the limb kept at rest. Upon examination the next day, the clamp was found started from the upper fragment and the displacement reproduced. I immediately reopened the incision of the previous day, and with a strong needle, curved in a semicircle, passed a thick doubled silver wire around each fragment of the bone, twisting the wires down over the clamp, about a quarter of an inch from each extremity, Fig. 3, *c* and *d*. The twists thus formed were then brought together and re-twisted, making the whole bundle, Fig. 3, *e*, consist of eight wires, which were brought out of the wound. The fragments now seemed so firmly approximated that they could not be separated without breaking the wires. A piece of oakum saturated with balsam of Peru was left in the wound, and the limb placed in an anterior angular splint, extending from the shoulder to the ends of the fingers, and three firm straight splints were adapted to the lateral and posterior portions of the arm. The patient was then placed upon his back, with strict orders that he should not be moved for *any* purpose.

Each day the oakum was removed and the finger passed down to the bone, making sure that the clamp and wires remained in position, until Nov. 7th, when some hemorrhage occurred from a small superficial vessel, and the patient was moved and bed changed.

On Nov. 26th the dressings were entirely removed, for the first time, and slight union was discovered. The patient was now allowed to leave his bed, splints were re-applied, and again removed on Dec. 9th, when union was complete and firm. About Dec. 20th an attempt was made to remove the wires and clamp, but they all seemed to be so firmly imbedded in the provisional tissue, and the wound bore such a healthy appearance



that I cut the wires off as closely as possible to the bone, and left them in position.

When I examined this patient last, about two weeks ago, the wound was almost closed, and the slight discharge not irritating or offensive. The mobility of the elbow-joint was slightly impaired, but improving; the man was employed in the lighter branches of his occupation.

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#### ARTICLE XI.

##### CASE OF INTRA-OVARIAN PREGNANCY, WITH POST-MORTEM EXAMINATION. By TALBOT JONES, M.D., of St. Paul, Minnesota.

FEW events connected with the parturient state are more disastrous to the patient than the arrest of the vitalized germ in its passage from the ovary to the cavity of the uterus. This is true whether the fecundated ovule be retained in the ovary constituting what is known as ovarian pregnancy; is arrested in the Fallopian tube—tubal; or becomes imbedded in the uterine walls—interstitial. Ventral pregnancy—that variety in which the ovum, after impregnation, escapes into the abdominal cavity, there to remain indefinitely, is fortunately not nearly so fatal as the other varieties, although it too is attended with a very high rate of mortality.

This deviation from the normal course appears to have been known, though very imperfectly, to the ancients, for several of the early writers have alluded to such a condition. Albucasis saw a case where fœtal bones and débris were taken from what he termed an abscess, which had formed near the umbilicus. Horstius and Riolan, Jr., have mentioned somewhat similar cases.

*Causes.*—The etiology of this arrest is very obscure, and must remain so, for the obstacles are insuperable in the way of ascertaining with a reasonable degree of certainty the causes of extra-uterine fœtation, from our ignorance of the mechanism by which the fimbriated extremity of the Fallopian tube grasps the ovary. Again, the means at our command for diagnosing this condition are not very reliable, and cannot be depended upon. Various theories have from time to time been advanced by different observers, yet to candid persons it must appear that with all that has been written our knowledge is still merely speculative. It has been supposed that there exist some morbid condition of the Fallopian tubes, such, for example, as paralysis or spasm, some deviation of its length, but especially some engorgement of its mucous membrane, either congestive or inflammatory, producing mechanical obstruction to the passage of the fecundated ovule. This explanation appears plausible enough, when we remember that the Fallopian tube normally will scarcely admit of a bristle. Some have supposed that the tubal variety is often dependent on complete

closure and obliteration of the tube. Indeed several cases of this variety have been observed. M. Gaide (*Journal Hebdomadaire*, t. i.) ascertained that in an interstitial pregnancy the right tube had no uterine orifice. M. Menière (*Archives Gen.*, June, 1826) encountered a similar case, only that in this instance the left instead of the right tube was impermeable. Cazeaux also had the opportunity of observing two cases of complete stricture of the tube, recorded in the *Bull. de la Société Anat.* Virchow has noticed that this variety of pregnancy is frequently accompanied by adhesions of the internal genital organs, caused by false membranes, or cicatricial tissue, and is noticed much more frequently on the left side. Why ovarian pregnancy should ever occur must remain problematical.

Among the accidental causes numerous facts seem to show that fright or terror, occurring at the moment fecundation is being effected, may produce such a profound impression through the nervous system as to arrest the further progress of the ovule towards the uterus.

Curious examples are on record where shock and great agitation received in coitu have been supposed to produce this. Thus Baudelocque (*Dict. des Sciences Med.*, vol. xix.) relates a case of extra-uterine pregnancy, which is supposed to have been due to the shock received during the conjugal embrace, from hearing some one trying to enter the apartment. Lallemand (*Nouv. Journal de Med.*, vol. ii. page 320) cites a similar case, "and a third woman experienced much alarm by a stone being thrown through the window of her chamber during the time of sexual connection." Though these and other cases which might be cited seem to establish some connection between fright and the abnormal condition under consideration, yet, notwithstanding the high authority of the advocates of this doctrine, I cannot accept the explanation as satisfactory, or as having as a basis any foundation in fact. The truth is that the ovule does not part from the ovary either at the moment of fructification or during the time of sexual connection, but may do so several days prior or subsequent to this time, and this I think is fatal to the theory of fright. M. Dezeimeris relates a case where, shortly after fruitful connection, a blow received upon the hypogastrium was supposed to have caused this anomaly: and Montgomery, in one reported by Jackson in the *Dub. Med. Journ.*, vol. ii., "thinks a blow received on the abdomen shortly after conception produced such a degree of inflammation and engorgement as to arrest the ovule in its transit from the ovarium." It is a surprising fact that this accident is much more apt to occur in widows and unmarried women—a statement which rather lends support to this theory of fright or agitation. Campbell, in his learned and valuable memoir, says that out of fifteen cases, five were single, certainly a very large proportion when we remember the comparatively small number of unmarried females who become pregnant.

Malformation of the uterus is supposed in some instances to stand in causative relation. Meadows had the opportunity of examining, *post-mor-*

tem, two cases of this kind, and found that the Fallopian tube, on the side corresponding with the arrested ovule, joined the uterus one inch below the fundus, thus causing "a deviation of the Fallopian canal and consequent arrest of the ovum in its passage to the uterus." Years ago Coste (*Embryogenië Comparée*, vol. i. page 383) made the assertion, which, for a long time, remained uncontroverted, that of all animals woman alone was subject to extra-uterine pregnancy. This, however, is now known to be untrue: it has been known to occur repeatedly amongst brutes, and in Campbell's memoir, there are cited instances in which it has been observed in the hare, bitch, sheep, cow, and other animals. But it is the consideration of the ovarian variety, pure and simple, which chiefly concerns us in this article—that in which the ovum after being fructified lies imbedded in the ovary.

*Occurrence.*—Ovarian pregnancy is so rare that many eminent anatomists and pathologists deny its ever occurring except where the fimbriated extremity of the Fallopian tube, having grasped the ovary, formed part of the cyst, and which, therefore, strictly speaking, would constitute a tubo-ovarian pregnancy. Those who hold to this belief maintain that fecundation can never occur in the vesicle of the ovary before the rupture of the ovisac. In other words that it is impossible for the spermatozoon to penetrate the ovisac without disturbing its integrity. So accurate an observer as Velpeau (*Trait. Elémén. de la l' Art des Accouch.*, vol. i.) was led into the error of this belief. His opinion was founded upon the hypothesis, which subsequent investigation has shown to have been badly taken, that the ovum could never be impregnated without being detached from its bed. Allen Thomson (*Cyclop. of Anat. and Physiol.*, part xiii.) likewise maintained that intra-ovarian pregnancy for the same reasons never existed.

Farre and Thomas also hold to this view, and the latter has maintained his opinion with his accustomed ability and vigour. But the fact has been established beyond all doubt that the fœtus has been found within the ovary, and has in some instances progressively developed there up to the 4th or 5th month, when rupture of the cyst occurs. "No doubt there is great difficulty in determining the exact locality of the misplaced gestation in these cases of supposed ovarian pregnancy, but there seems to be no reason why, when the fimbria is applied to the ovary which is on the point of rupturing, the spermatozoa should not trail along the tube, and actually penetrate the outer coat of the ovisac just as the ovum is escaping. In this way ovarian gestation would be commenced"—(Meadows). Indeed there are just such cases on record. In the work of MM. Bernutz and Goupil, translated by Meadows, for the New Sydenham Society, vol i. page 249, there is such a case recorded.

At a meeting of the N. Y. Obstetrical Society, Feb. 1865, Dr. Kammerer presented a specimen of extra-uterine gravidity from a woman 30 years of age, who had died a year previous. She had been under treat-

ment for chronic metritis, and had passed from under his care, with the exception of the introduction of a large sound, once a month, to keep the cervix open. Seven or eight years previously she had a child. She became again pregnant, and a little time subsequently was taken suddenly ill with symptoms of internal hemorrhage and peritonitis, and in the course of a few hours died. Upon post-mortem examination, several quarts of blood were found within the peritoneal cavity, and on the left ovary a rent revealing the source of the hemorrhage. On opening the ovary an embryo was discovered about four weeks old. In reply to a question by Dr. E. R. Peaslee, Dr. K. said that he could see no decidua within the uterine cavity (*N. Y. Medical Journal*, May, 1865). The case which I report in this article was one of pure uncomplicated intra-ovarian pregnancy. The earliest example on record of this variety of foetation is found in the *Philos. Trans.*, vol. ii., reported by the Abbé de la Roque in 1682. An interesting case of ovarian gestation has been reported by J. Hall Davis in the *Transactions of the Obstetrical Society of London*, 1860, where the left ovary had degenerated into a mere cyst, and contained a dead foetus.

In addition to these cases I will mention one each recorded by Granville and Boehmer, together with the ten well-known cases collected by Spiegelberg, (*Arch. f. Gynæ.*, xiii. p. 74), which include cases of Willigk, Hein, Martyn, Giesserow, Hess, Kiwisch, Wright, Hecker, and others.

Since Spiegelberg collected these cases there have been two additional ones reported, viz., one in the *Gaz. Obstetricale*, Bernutz, Jan. 1879, and one by Patenko (*Arch. f. Gynæ.*, xiv., lately issued).

Cohnstein (*Arch. f. Gynækologie*, xii. p. 367) has formulated certain rules for the proof that ovarian pregnancy exists, and without which, he maintains, no case of this variety is entitled to recognition. His rules are in the highest degree arbitrary, and, although I am quite willing to accept them and abide by the result, so far as they apply to the case I report, still, if adopted without reservation, it is almost certain to deny recognition to others which are clearly cases of intra-ovarian pregnancy, but which for various reasons cannot be established as such with the absolute clearness which a strict compliance with all his rules demands.

Among his rules may be mentioned the following: (a) Cylindrical epithelium must be seen under the microscope, taken from the interior of the cavity inclosing the ovum; (b) passage of the fibres of the tunica albuginea into the wall of the ovisac; (c) particles of ovarian tissue in close continuity to the cavity containing the ovum; (d) absence of the ovary of that side; (e) connection of the ovisac with the uterus through the ovarian ligament.

I have no doubt that cases of ovarian foetation are sometimes met which show themselves as such with great distinctiveness, but which are difficult if not impossible of demonstration. For example, in one case the Fallopian tube might be seen; also the round and ovarian ligaments; that it

was inclosed within the broad ligaments; absence of the ovary of that side; you might even secure the ovary, post-mortem, and, with a care which would admit of no mistake, open it and find therein a *fœtus*, as has been done, and yet, because no cylindrical epithelium could be shown, or perhaps no fibres of the tunica albuginea discovered penetrating the wall of the ovisac, therefore the case was not entitled to recognition, although it would be perfectly apparent alike to reason, analogy, and to sight, that it was one of intra-ovarian gestation. Cohnstein's formulated rules, if adopted, would deny recognition to Dr. Kammerer's interesting case, already alluded to, because the latter failed to examine for ovarian fibres and cylindrical epithelium under the microscope, or perhaps neglected to search sufficiently for the ligament of the ovary, although he exhibited his specimen to the New York Obstetrical Society, was closely questioned in regard to it by Dr. Peaslee and other eminent members, and even opened the ovary and found therein the four weeks' embryo. Haselberg has lately reported a case, and described it minutely, still, because he neglected to make mention of the Fallopian tube, the case was for that reason omitted in the number recently collected and reported by Spiegelberg. For the same reason the case of J. Hall Davis and those of Granville and Boehmer would fail of recognition if judged by the rule insisted upon by our German confrères.

*Symptoms.*—As soon as the impregnated ovum takes up its abode in the ovary the uterus at once undergoes decided changes. There is a determination of blood to the organ, as in ordinary impregnation. A tough, gelatinous mucus, thick and ropy, secreted by the glands of the cervix, plugs the neck of the womb. The organ increases in size to a remarkable degree, sometimes enlarging even to two or three times its ordinary bulk; the mucous membrane becomes hypertrophied and considerably congested. There is a true decidua formed within its cavity, although Dr. Robert Lee does not believe this, and in the *Med. Gazette*, vol. xxvi., cites two cases which came under his observation to disprove such an idea. Velpeau concurred with Dr. Lee in the belief that a true intra-uterine decidual membrane never formed in extra-uterine impregnation. There are now, however, few if any who still hold to this opinion. The late Dr. John S. Parry, from a careful analysis of over five hundred cases (*Extra-uterine Pregnancy*, Phila., 1876), came to the conclusion that a true decidual membrane forms in the uterus alone and never in the cyst. His work is the most comprehensive in any language, and the deductions of Dr. Parry are entitled to great weight. Indeed, the weight of testimony is well nigh unanimous that such a membrane does form, but that it is of short duration, "for, as the ovum does not enter the uterus, it has no office to perform, and therefore, like every other useless organ, becomes atrophied, loses its vascularity, and in a few months has returned to its normal condition." It undergoes a process of disintegration, and is eventually thrown off. For-

tunately this matter is taken from the domain of speculation, and placed within that of clinical observation by Breschet, Campbell, and others. Some of these observers have seen the decidual membrane in the uterus *in situ* or after its expulsion by uterine action, which is usually accompanied by some sanguineous discharge.

In addition to the symptoms already enumerated may be mentioned the fact that in the intra-ovarian variety, the enlargement of the abdomen, if the patient does not die from rupture of the cyst before this is well marked, is not in the mesial line, but upon the side. Sometimes menstruation continues regularly, in other cases it disappears entirely. Severe hemorrhage may occur, which will probably lead to the supposition that abortion has taken place. In almost all cases there is from the start more or less abdominal pain; this may be so severe as to excite suspicion of peritonitis. Generally, however, the pain is analogous to uterine pain. A sense of weight and oppression is oftentimes felt by patients. There may be present much irritability of the bladder, painful diarrhœa, and perhaps tenesmus. The most reliable of all evidence is that obtained by a vaginal examination. If carefully conducted an enlargement can be readily detected on the side of the uterus, especially if the conjoined manipulation be practised. In the majority of cases the uterus is displaced.

The anatomo-pathological phenomenon which has, perhaps, excited the greatest interest of embryologists, is that which relates to the amnion and chorion, the placenta and cord. Do these form in cases of intra-ovarian foetation? It does not come within the scope of this article to enter upon a discussion of the different theories and conflicting opinions which have in the past engaged the attention of individual writers or learned societies upon this question. At the expense of being considered dogmatic, I will say at once, and without fear of its being successfully controverted, that wherever the vitalized germ takes up its abode there the ovule will have its proper membranes—the amnion, chorion, placenta, and cord. This view, it need scarcely be said, is by no means accepted by all. There are men whose names carry great weight and whose opinions in such matters are entitled to our most respectful consideration, who far from believing this are rather disposed to believe that these being uterine organs either do not form at all, or, if so, are very imperfectly developed. There are others who maintain that the amnion and placenta are formed in extra-ovarian pregnancy, but the chorion and cord are absent. Cazeaux mentions, somewhere in his works, of a discussion to which he listened before the Academy of Medicine, Paris, during which learned members contended there was present in these cases of extra-uterine pregnancy an amnion but no chorion. The fallacy of this is apparent at once, when we remember the way in which the ovum is developed; the allantois is necessarily absent if the chorion is not developed, and without the former no circulation can take place between the mother and embryo. The placenta is very much

like that seen in an ordinary case of pregnancy, though greater in circumference, thinner and flatter. The cord closely resembles in size, length, and structure that observed in cases of uterine pregnancy.

*Duration.*—If observers could agree with reasonable unanimity upon any subject admitting of controversy, it would seem they could upon the question of the duration of the different varieties of extra-uterine foetation. But it must be admitted that even here there is the greatest difference of opinion. “The duration of extra-uterine pregnancy will depend upon the situation; thus, if it be in the Fallopian tube it rarely lasts beyond two months, whereas ovarian pregnancy will continue for five or six months; on the other hand, in ventral pregnancy the foetus will not only be carried to full term, but far beyond that period, amounting to several years.” (Rigby.)

Campbell, in his monograph, says: “In ninety cases in which we can decide, or nearly so, on the stage of the pregnancy, the foetus in seventy-nine patients died at the close of the ninth month or soon thereafter—one in the eighth, seven about the seventh, one in the sixth, two in the fifth, two in the fourth, five in the third, and one at the end of the first month.” But I cannot help agreeing with Meadows in the doubt he has thrown on the accuracy of these statistics. He says: “I cannot help thinking that there is some mistake in these figures, for whereas Dr. Campbell seems to imply that the chances are largely in favour of the foetus going to the last month of utero-gestation, the experience of most men is certainly opposed to this, and taking the whole number and varieties of extra-uterine pregnancy, it appears that the chance of a rupture of the cyst increases with each succeeding month, and that very few pass beyond the fourth or fifth month.”

It thus appears that of Campbell's ninety cases in seventy-nine, or about 85 per cent., the patients remained in good health up to the close of the ninth month of gestation, whereas the experience of the vast majority of observers indicates that death from rupture of the cyst occurs before the fifth month in fully two-thirds, or 67 per cent. of all cases. The cases in which rupture takes place earliest are the tubal. In the few cases which have been reported of the internal ovarian variety, the rupture occurred on an average some weeks or months later than in the tubal variety. In the one I shall report death from rupture of the cyst occurred during the fourth month. In Dr. Kammerer's case the rupture took place at the end of four weeks; in a case reported by Ramsbotham between the third and fourth month. All these were strictly intra-ovarian.

That internal ovarian pregnancy will not, as a rule, be prolonged beyond the fourth or fifth month is clearly indicated, and the indication is sustained by concurrent testimony. I am aware that this statement is apparently opposed to the view of Campbell on this subject heretofore quoted, but it may be only apparent, since in his statement of the probable duration of extra-uterine pregnancy he may have made, and probably

did make, his estimates without reference to the ovarian variety. Lesouef, who has given this subject careful study, dwells at length on the tendency of the tubal variety to rupture early.

Abdominal or ventral pregnancy may continue indefinitely. A remarkable case is on record where the fœtus remained in the abdominal cavity of the mother for upwards of forty-three years. Even more remarkable still is the case reported by Mr. L. R. Cooke in the *Transactions of the Obstetrical Society of London* (1864). A patient died two days after delivery of a dead child. *Post-mortem* examination revealed a large tumor in the abdomen. On examination a full sized child was found in the abdominal cavity "inclosed in its own membranes and having apparently been developed in the fimbriated extremity of the Fallopian tube."

*Termination.*—A few words with reference to the probable termination of extra-uterine foetation. It may be stated as a rule, to which there are unfortunately but few exceptions, that the patient dies suddenly from rupture of the cyst, either primarily from shock incident to this accident, or secondarily of peritonitis from effusion into the peritoneal cavity. The exceptions are those rare cases of ventral pregnancy in which the fructified ovule, after having fallen into the abdominal cavity, there remains and develops, the fœtus advancing it may be to full term, then dying, either remains there indefinitely, with but little discomfort to the mother, or else—and this is much the more common rule—undergoes a process of disintegration and absorption. Not unfrequently the vitalized ovule after falling into the abdominal cavity becomes encysted and may remain there with but little constitutional disturbance for years. There are one or two curious cases on record where the patient continued in fair health for years, although labouring under intra-ovarian pregnancy. Granville had such a case in which the "fœtus lived for four months, but the patient survived ten years and a half, and then died of internal hemorrhage."

When the fœtus dies the circulation in the cyst is diminished, and it takes on rapid atrophy; becomes more indurated, and is now nothing more than a foreign body in the abdominal cavity. The vital powers begin to flag. Pain may be a prominent symptom from the start, or, on the contrary, may be but little felt. Generally the cyst sooner or later breaks down, ulcerations invade its walls, fistulous communications form openings either into the bowel, uterus, bladder—rarely the stomach—or else through the abdominal parietes; the fœtal debris quickly pass through these fistulous canals by piece-meal, or the contents are discharged seriatim. This ulceration and discharge may continue for a long time, and undermine the patient's strength. The springs of life are sapped, and, finally, after a variable period, the patient succumbs.

*Prognosis.*—The prognosis of all varieties of extra-uterine pregnancy *a priori* is extremely unfavourable; in the vast majority of cases the patient dies, and usually expires suddenly. The mortality has been variously



estimated from 65 to 99 per cent., the latter having reference to the ovarian and tubal varieties, the former to the ventral or abdominal.

To discuss the treatment of extra-uterine gravidity would be inconsistent with the original aim of this article.

The following interesting case occurred some time since in the practice of Dr. J. H. Murphy, of this city.

Mrs. M., age 38, native, married twelve or fifteen years, of average size, and had always enjoyed fair general health. Moved in the higher walks of life. Her three former confinements were perfectly normal. Seven years before the last pregnancy she had been delivered of a healthy child. In May she again became pregnant, as the subsequent history will show, for the fourth time. During the four succeeding months she experienced the usual symptoms of this condition — suppression of the catamenia, morning nausea, enlargement of the breasts, deeply shaded areola, and slight secretion of milk. Even with these symptoms present, strange to say, *the patient did not consider herself pregnant*. During the middle of August there was noticed some enlargement of the abdomen, not centrally, but rather on the left side. About this time she began to experience severe spasmodic pains in the abdomen, which would usually commence on one side of the inguinal region, and suddenly dart to the opposite side.

Pain in the back was also a concomitant symptom. It was distinctly paroxysmal in character, and so intense as often to cause syncope outright. It was for the relief of this that she applied to her physician for treatment. The latter after hearing her statement told her at once that she was pregnant. So satisfied was he of this that no vaginal examination was deemed necessary. She was advised to try and bear her troubles for a while as patiently as possible. A simple opiate to quiet pain was given.

The patient, it appears, not altogether satisfied with this diagnosis and advice, applied to another physician, who, after a vaginal examination, came to the conclusion that she was laboring under some obscure disease of the left ovary, and advised her to undergo treatment appropriate to such cases. Still dissatisfied and now alarmed at her condition, she applied to Dr. Murphy during the middle of September, and placed herself under his care. The doctor after hearing the previous history of her case made examination *per vaginam* with the following result:—

The enlarged uterus was felt distinctly retroflexed with the fundus well down in the hollow of the sacrum. The cervix was rather soft and spongy, long, and high up. External os slightly open, Internal os closed. The uterus was movable and somewhat tender to the touch. By conjoined manipulation a tense, resistant tumour was felt, occupying the left pelvis, which gave to the finger an impression of elasticity. It was only slightly movable, globular in shape, and apparently about the size of an orange. By percussion through the abdominal wall over the tumour there was dulness, but not absolute flatness. A distinct outline of the tumour could be traced through the abdominal walls. Obscure fluctuation was detected over the tumour. The patient always experienced some pain on the passage of her urine, and this was voided more frequently than usual. The bladder occupied its normal site. A positive diagnosis was not arrived at, though there was a strong suspicion of either ovarian or tubal pregnancy. The attempts to distinguish different portions of the supposed fœtus, as a hand or foot, through the coats of the vagina, failed.

Medical counsel was called, and with the concurrence of all present it was decided to carefully introduce a sound into the uterus.

After placing the woman on her back, this was done, though not without considerable hesitation, since, with these symptoms of pregnancy present, the probability of a normal pregnancy in a retroflexed uterus was not lost sight of. However, the sound readily entered the uterus to the fundus, and no more obstacle to its entrance was noticed than is always experienced in passing this instrument in a uterus bent on itself. The womb was considerably enlarged, measuring by the sound just five inches in length. Neither a tumour nor foetus could be detected in the uterine cavity. The mother had never experienced any movement of the child, and at no time could foetal heart sounds be detected. The differential diagnosis now lay between ovarian or tubal foetation and ovarian disease of a mixed character which we occasionally meet, the gland being converted partly into different cysts containing fluid, and partly into a solid tumour. Great obscurity still attached to the case. Here was a case where many of the symptoms pointed to existing pregnancy, and yet the uterus was empty. The propriety of tapping the cyst through the vagina with a small aspirator needle was now seriously entertained. The operation for gastrotomy was also thought of.

Palliative treatment consisted in giving half-grain morphia suppositories by the rectum for the relief of the intense pain which came on in distinct paroxysms, and which greatly prostrated the patient. Her nervous system was now unstrung; sleep rarely came without artificial aid; the bowels were constipated and the secretions disordered. There was a constant pain in the lower back and through the loins. A discharge per vaginam occurred from time to time, though this was never profuse. Such was the condition of our patient toward the latter part of September, and far into the fourth month of her pregnancy. Being summoned, early one morning, in great haste, Dr. Murphy on reaching the patient found her in a state of collapse, and experiencing violent cramps in the side of her abdomen, much like severe colic. Hemorrhage was evidently the cause, for all the symptoms plainly pointed to this. Cold extremities, pallor of the countenance, excruciating abdominal suffering, clammy perspiration, extreme depression, a flickering pulse, and vomiting were a chain of symptoms not to be mistaken. Death soon closed the scene.

*Post-mortem examination*, made the day following her death, revealed about two pints of effused blood in the abdominal cavity. The enlarged ovary was inclosed between folds of the broad ligament. All the ovarian tissues were present. The Fallopian tube was secured with the ovary. No portion of it was enlarged, as it would have been were it a case of the tubo-ovarian variety. The specimen, as now seen in alcohol, shows the fimbriated extremity of the Fallopian tube grasping the ovary, at its upper and inner border, and of about normal size. About two inches in length of the tube, including the fimbriated extremity, was detached with the ovary. Unfortunately the ovarian ligament was cut off close to the ovary in removing this from the patient's body. The stump can, however, be seen in the specimen when closely examined. It is to be regretted that the uterus was not secured with the ovary, in order to have shown the relation these organs bore to each other. However, as a report of the case was not thought of at the time, this was overlooked. I have carefully examined under the microscope portions of the mass of tissue near the rent in the ovary, and find that it is true ovarian tissue. "Particles of ovarian tissue in close continuity to the cavity containing the ovum" were

plainly seen. I need scarcely say that "no ovary of that side" was found, except the one in which impregnation had taken place. No fibres of the tunica albuginea were seen passing into the wall of the ovisac, though for very obvious reasons. In order to have demonstrated this, mutilation of the specimen would have been necessary, and it was not considered desirable to do this. The left ovary was about the size of a large orange. There was a rent about three inches long in its anterior wall, revealing the source of the hemorrhage. Bulging out through this rent was seen a four months' fœtus surrounded by its own membranes—the amnion and chorion—with the fœtus still floating in the liquor amnii. By careful dissection the entire ovary was secured without injury to this organ, and without rupture of the bag of waters.

There could be no difference of opinion concerning this case of intra-ovarian pregnancy. Everything showed with the utmost distinctness. The fontanelles in the child's head could be seen through the delicate membrane inclosing the fœtus. The finger could trace the different forms of the skull, the fissures, fontanelles, etc., as well as detect every portion of the child by pinching it up between the fingers. In short, here was a case of pure internal ovarian fœtation, in which the fœtus was entirely surrounded by ovarian membranes and imbedded in the gland, which progressively developed there up to the fourth month, when rupture of the cyst caused hemorrhage into the abdominal cavity, and, as a result of this effusion, death to the mother. Examination of the uterus yielded negative results. It was found enlarged, and its mucous membrane much congested; but whether a true decidua was there present, or had been at any time, could not be determined with any degree of certainty. The ovary, is now preserved in alcohol, has been seen by many distinguished physicians, among whom I may mention Prof. Samuel White Thayer, M.D., of the University of Vermont, and Prof. Ford, of Ann Arbor, Mich., none of whom have expressed the slightest doubt as to its being a case of intra-ovarian fœtation. The specimen was also exhibited before the Minnesota State Medical Society, at its meeting in St. Paul two years ago.

Theoretically, I suppose there will be in the future, as in the past, doubts thrown on the possibility of this condition ever occurring; but for an unprejudiced man, who has once seen this specimen, to still doubt the occurrence of internal ovarian pregnancy, would be for him to doubt the accuracy of his own powers of vision.

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#### ARTICLE XII.

DUBOISIA AS A MYDRIATIC, WITH REMARKS ON ITS PHYSIOLOGICAL AND TOXIC EFFECTS. By WM. F. NORRIS, M.D., Clinical Professor of Ophthalmology in the University of Pennsylvania.

ON the third of last April, Petit, of Paris, and Gerrard, of London, each exhibited to the Pharmaceutical Society of their respective cities a

specimen of a new alkaloid duboisia, with remarks on its method of preparation, and its analogies to atropia. Petit maintains that it is a distinct alkaloid because of its greater solubility in water, a certain fluorescence of its solution, and the fact that it rotates the plane of polarization to the right, while atropia seems to have no action on the polarized ray. Gerard also maintains that it is different from atropia because of its greater power of neutralizing acids and the peculiar odour it gives off when boiled with baryta. It is obtained from a small tree growing in Australia—the *Duboisia myoporoides*, which is classed with the Solanaceæ, and attains a height of about twenty feet. Dr. Bancroft, of Brisbane, Australia, who first introduced it to the notice of the profession, called attention to its power as a mydriatic and to the confusion of intellect and dryness of the throat produced by it. In the *Australian Med. Journal*, for Feb. 1877, p. 61, he compares the effect of the *Duboisia myoporoides* with that of the *Duboisia hopwoodii*, and states that the former has a much greater effect on the pupil. The natives call the latter Pituri, and chew the leaves as a stimulant and intoxicant. In a previous number of the same periodical (November, 1876) Bancroft describes the action of this drug (*D. hopwoodii*), and finds that it kills animals by arresting the respiration. In his remarks before the Pharmaceutical Society of London, April 3d, 1878, he states that the *D. myoporoides* administered to a dog causes him “to walk straight forward, and if he get into a corner to struggle and cry for a long time and paw at the wall, but it appeared never to occur to him to turn round.” “On cats, however, it had not this effect.” (*Pharmaceutical Journ. and Trans.*, April, 1878, p. 798.) Tweedy, in the *Lancet* for March 2d, 1878, details the action of the extract of duboisia on the pupil and on the accommodation, and shows that a solution of it (1 in 20) caused commencing dilatation of the pupil in ten minutes, and wide dilatation in fifteen. He maintains that the effect on the accommodation went on increasing for four hours when it reached the maximum. Its influence passed off so rapidly that forty-eight hours after this maximum effect, he could read with effort Snellen  $1\frac{1}{2}$  at  $5\frac{1}{2}''$ – $21''$ , although the pupil was still large. In four days the accommodation was “restored, and three days later the pupil was active and of its normal size.” Sydney Ringer, in the same article, gives an account of its physiological action, showing that in man it produces drowsiness, headache, dry throat, rise of pulse, and that it stops the sweating produced by pilocarpine; while in frogs, like atropia, it antagonizes the paralyzing action of muscarin on the heart. Galezowski also experimented with a watery solution of the extract (1–20), and states that “the dilatation of the pupil continues eight or ten days, and that its action is therefore more lasting than atropia, and that it does not, like atropia, cause any conjunctival irritation.” (*Gazette des Hôpitaux*, Avril 4, 1878, quoted in the March-April number of *Annales d'Oculistique*.) In an abstract of his remarks before the Société de Biologie, *Gaz. Heb-*

*domadaire*, 22d Nov. 1878, he is said to have compared the "alarming nervous accidents caused by it with those produced by atropia," but no details are given.

In the *Klinische Monatsblätter für Augenheilkunde* for May, 1878, Wecker published an article "On the comparative use of Eserine, Atropine, and Duboisine," in which he asserts that the latter may be advantageously used to replace atropia in all cases where, owing to idiosyncrasy of the individual, atropia excites conjunctival inflammation, and that the rapid mydriasis and paralysis of the accommodation caused by it is so great that a single application will relax all cramps of the ciliary muscle, while it often requires repeated instillations of atropia to effect the same object; and Seely, in the *Cincinnati Lancet and Clinic* of January 11th, 1879, substantiates these statements by his own clinical experience in the use of the drug. The above essays comprise all that I have been able to find in reference to the new mydriatic up to the present date (March 1st), and as duboisia appears destined to play an important role in ophthalmic therapeutics, a recital of my experience with it in my hospital and private practice during the last three months may not be uninteresting to the profession. My supply of the drug was obtained from Mr. Petit, of the Pharmacie Miabie in Paris,<sup>1</sup> and was a semisolid of light yellowish-brown colour, adhering to the end of a probe, and capable of being drawn out into filaments when this instrument was slowly withdrawn from it. It was readily soluble in water, and although labelled neutral, showed in solution a very slight acid reaction to litmus paper.

*Its Local Action as a Mydriatic.*

CASE I.—Dr. J. W., one of my assistants at the University, æt. 25, whose left eye had been last year carefully examined under atropia, and found to have a hypermetropic astigmatism of  $\frac{1}{6}$ . With this corrected his vision was  $\frac{20}{xx}$  and his near point  $4\frac{3}{4}$ ". Three minute drops of a 4 grain solution of sulphate of duboisia were instilled into the conjunctival sac of the left eye. In six minutes the pupil had commenced to dilate, and was ovoid with its long diameter at  $50^{\circ}$ . At 9 minutes pupil is nearly round, and measures 6 mm., and he cannot read Jaeger VI inside of  $20''$ . At 12 minutes is unable to read without convex glass, and with  $+\frac{1}{10}$  half an inch in front of the cornea cannot bring Jaeger I inside of  $8\frac{3}{4}''$ . At 13 minutes pupil measures 7 mm. and is immobile, at 14 minutes with  $+\frac{1}{10}$  punctum proximum is at  $9\frac{1}{2}''$ . At 15 minutes pupil dilated ad maximum, and measures 8 mm. At 18 minutes with  $+\frac{1}{10}$  Jr. I from  $9\frac{1}{2}''$ – $13''$ , sharpest at  $11\frac{1}{2}''$ . At 20 minutes the same. At 25 minutes  $+\frac{1}{10}$  Cy. axis at  $15^{\circ}$   $V = \frac{20}{xx}$ , and with  $+\frac{1}{10}$  combined with same cylinder Jr. I from  $9''$ – $12\frac{1}{2}''$ , best at  $9\frac{1}{2}''$ . He was examined at 35 and at 45 minutes, but there was no further change either in the size of the pupil, acuity of vision, or in the range of accommodation. He complains of dizziness on rising to walk,

<sup>1</sup> It was imported for me by Mr. George I. McKelway, Apothecary, 1410 Chestnut Street, Philadelphia, of whom a supply of the drug may be obtained.

—feels as if his legs would give way under him—and of slight dryness of the throat.

Twenty-four hours after the application with  $+ \frac{1}{10} \text{ C.}$ , near point at  $9''$ . In forty-eight hours with same glass near point of  $6\frac{1}{2}''$ , and pupil has contracted to  $6\frac{1}{2} \text{ mm.}$  On the third day with same combination near point is at  $5\frac{1}{2}''$ , and without a glass can read Jaeger I up to  $9''$ . On the fourth day with his cylinder alone near point is at  $5''$ . On the sixth day with his cylinder the near point is at  $5''$ , pupil measures  $3 \text{ mm.}$ , while that of the other eye measures only  $2 \text{ mm.}$  On the ninth day pupil is still a trifle larger than that of the right eye, and with his cylinder the near point is at  $4\frac{3}{4}''$ .

CASE II.—Miss M. K., æt. 26.  $V = \frac{20}{\text{LXX}}$  in each eye, and reads Jaeger I from  $5''$ – $18''$ . Two drops of a 4-gr. solution of the sulphate of atropia were dropped into the left eye, and as soon as practicable thereafter a similar quantity of a 4-gr. solution of sulphate of duboisia into the right eye.

*Right Eye—Duboisia.*—In five minutes the pupil is vertically ovoid and irregular; in response to change of light and shadow the least-dilated portions show the most movement. It measures  $4\frac{1}{2}$  by  $7 \text{ mm.}$  At 10 minutes it is firmly contracted everywhere except at temporal side; and is irregularly round. At 12 minutes it has contracted evenly all round, and measures  $8 \text{ mm.}$  At 18 minutes can read Jaeger 19 with effort at arm's

length,  $V = \frac{20}{\text{LXX}}$  and sees horizontal lines best. With  $+ \frac{1}{10}$  reads Jr. I from

$10\frac{1}{2}''$ – $12\frac{1}{2}''$ . In  $1\frac{1}{2}$  hours  $V = \frac{20}{\text{LXX}}$ , with  $+ \frac{1}{48} \frac{20}{\text{XX}}$ ; sees all lines in

Green's dial alike, and rejects cylinders. With  $+ \frac{1}{10}$  Jr. I from  $11''$ – $13\frac{1}{2}''$ . The instillation was repeated on the following day; patient picked out  $+ \frac{1}{36}$ ; and again, on the third day, when she preferred  $+ \frac{1}{42}$ . She then returned home, and I did not see her for twelve days, but she informs me that on the evening of the second day after the last instillation of duboisia she could spell out for a moment newspaper print. Twelve days after the last application the pupil in strong light measures  $1\frac{1}{2} \text{ mm.}$ , and with her correcting glass  $+ \frac{1}{42}$  could read Jaeger I from  $5\frac{1}{4}''$ – $18''$ .

*Left Eye—Atropia.*—At 11 minutes pupil ovoid and responsive to light,  $5$  by  $3 \text{ mm.}$  At 15 minutes nearly round,  $5 \text{ mm.}$  with scarcely perceptible motion. At 18 minutes can read with difficulty Jaeger I. At 23 minutes pupil  $8 \text{ mm.}$ ; can still read Jr. I at  $11''$ . At 30 minutes can no longer read "brilliant," but spells out Jr. II. At 35 minutes Jr. IV with difficulty at  $11''$ , and with  $+ \frac{1}{10}$  Jr. I from  $6''$ – $9\frac{1}{2}''$ . In one hour and a half

$V = \frac{20}{\text{L}}$ , and with  $+ \frac{1}{10}$  reads Jr. I from  $9''$ – $12''$ ; pupil measures  $8 \text{ mm.}$

The instillation was repeated on the following day, and with  $+ \frac{1}{10}$  patient could read Jr. I from  $10\frac{1}{2}''$ – $13''$ ; and again, in the third day, with the same result. She says that with this eye she could not spell out any newspaper print till the morning of the fifth day, after the last instillation of atropia. Twelve days after this, pupil measured in strong light  $2\frac{1}{2} \text{ mm.}$ , and with her correcting glass  $+ \frac{1}{42}$  reads Jr. I from  $5\frac{1}{2}''$ – $16''$ .

CASE III.—Spasm of the ciliary muscle in a young girl, M. C., aged 13. She complains of being nearsighted and obliged to hold her book too close, with inability to see the blackboard at school. At present  $V$  in

each eye  $\frac{5}{CC}$ , and reads Snellen  $I\frac{1}{2}$  from  $3\frac{1}{2}''-7''$ , and not at any point further off. Nevertheless, after a short sojourn in a dark room, ophthalmoscopic examination shows that the eye is nearly emmetropic, and that the fundus can be seen sharply without any glass. Three drops of a 4-gr. solution sulphate of duboisia were therefore instilled into each eye. The pupils commenced to dilate in 8 minutes; in 11 minutes they were vertically ovoid; in 18 minutes ovoid, sluggish, but still mobile; at 20 minutes they were nearly round, and V had risen to  $\frac{20}{C}$ . In 26 minutes pupils absolutely immobile and round, and with  $+\frac{1}{10}$  reads Sn.  $I\frac{1}{2}$  from  $7''-9''$ . In 55 minutes  $V = \frac{20}{LXX}$ , and with  $+\frac{1}{10}$  Sn.  $I\frac{1}{2}$   $9\frac{1}{2}''-10\frac{1}{2}''$ . In 60 minutes with  $+\frac{1}{18}$   $V = \frac{20}{XXX}$ , and in 68 minutes with  $+\frac{1}{10}$  Sn.  $I\frac{1}{2}$  from  $11''-12''$ . Three days later her accommodation was  $\frac{1}{16}$ .

These three are selected as fair examples out of thirty cases in which I have used three drops of a 4-gr. solution of sulphate of duboisia for the purpose of testing the refraction, and in which I have carefully noted the effect every few minutes. In most instances I have put an equal quantity of a like solution of sulphate of atropia into the other eye in order better to be able to compare their action. Every one who has frequently used atropia as a mydriatic has had opportunity to observe the occasional irregularity of its action on irides which are not bound down by synechiæ and in which there has never been any attack of inflammation. These irregularities are much more frequent and exaggerated when duboisia is employed, but here, as in case of atropia, the pupil eventually becomes round. In none of the cases has the ad maximum dilatation of duboisia been any greater than the ad maximum dilatation of atropia; but the pupils have finally acquired exactly the same size, and this is to my mind good proof that we will not succeed in tearing loose resistant adhesions of the iris to the capsule of the lens any better with the new mydriatic than with that so long employed.

The action of duboisia is, however, much more rapid; and we attain usually in adults a full dilatation of the pupil in from 12 to 18 minutes, while in the same individual an equal quantity of atropia requires from 23 to 30 minutes to produce the same result.

As regards the accommodation, we attain usually in from 30 to 50 minutes an effect similar to that produced by atropia in the same individual in from 80 to 100 minutes. The dilatation of the pupil and the paralysis of the accommodation produced by duboisia pass off much more rapidly than those of atropia, and in the thirty cases above referred to, the eye into which duboisia had been instilled recovered its power of reading from two to three days sooner than that treated with atropia.

*Its Physiological and Toxic Effects. On Animals.*—The sulphate of duboisia, when injected under the skin, produces intoxication, delirium,

dilatation of the pupils, loss of co-ordinating power over the limbs, and relaxation of the sphincters (urination and defecation), with a marked rise of temperature, followed by a decided fall of it below the normal standard.

*Experiment 1.*—An incision was made in the back of a small terrier dog; and a thermometer-bulb, introduced through it, and placed beneath the skin, showed a temperature of  $101\frac{1}{10}^{\circ}$  F., and at the same time the pulse was 92 and respiration 20. The twelfth ( $\frac{1}{12}$ ) of a grain of sulphate of duboisia was injected under the skin of the belly, and in 10 minutes pulse was 240, respiration 12, and there was violent twitching of the hind legs. In 20 minutes the temperature was  $102^{\circ}$ , and the pulse 264. At 30 minutes the dog was placed on his feet and staggered in walking—knocking against the tables and chairs—and showed relaxation of the sphincters of the bladder and rectum (urinated and defecated). Ophthalmoscope shows the previously very pink disk, from contrast with the green tapetum surrounding it, to be darker and more congested, and retinal veins fuller. In an hour temperature  $100\frac{3}{8}^{\circ}$ ; respiration 12; pulse 158. The animal staggers less when placed upon his feet, and has less twitching of the muscles; but is evidently delirious, and when lying undisturbed cries and moves as hunting dogs do when lying before a fire dreaming. A subcutaneous injection of an eighth of a grain of morphia was now given; soon after the animal vomited and became soporose; it was difficult to rouse him. In  $1\frac{1}{4}$  hour pulse was 132; respiration 16. Next day the dog was languid, but ate its food; and on the second day was as bright and lively as ever.

*Expt. 2.* A half-grown healthy mongrel, with pointer blood, about four times the weight of the dog previously experimented with. Temperature under skin of back  $102\frac{4}{5}^{\circ}$ ; respiration 54; pulse 176. The acceleration of the pulse and respiration was owing to the violent struggles of the animal to prevent the skin being cut and the thermometer inserted under it. The  $\frac{1}{12}$  grain of the sulphate of duboisia was injected under the skin of the belly, and in five minutes the respiration had risen to 200, varying in successive minutes between this and 240; the pulse was 200. At eight minutes the pupils were dilated, but responsive to light, the animal struggling violently. At twelve minutes the pupils had become immobile, the struggles less violent, the respiration jerky and irregular, and the same form of delirium in the other case, as evidenced by the cries as if chasing prey, and the motions of the paws as if in running. Urination and vomiting. At 20 minutes the temperature had risen to  $103^{\circ}$ ; pulse 80, intermittent, dicrotic, and feeble; respiration 28. The animal has become sleepy and is quiet. When set free, and placed on its feet, the dog staggers, and has apparent want of power in his hind legs, which go slipping back from under him, but he can still slowly come if called. At 35 minutes stands languid and sleepy, and again vomited. At 50 minutes the temperature had fallen to  $99^{\circ}$ ; pulse feeble and 168; respiration calm, and 24 to a minute.

In an hour further vomiting; next day the dog was languid, and on the second day had regained his usual health and vigour.

*Expt. 3.* A healthy young albino rabbit; temperature under the skin of the back  $103\frac{1}{2}^{\circ}$ ; pulse 128; respiration 80. In five minutes after a subcutaneous injection of  $\frac{1}{12}$  gr. of sulphate of duboisia, temperature had risen to  $103\frac{3}{8}^{\circ}$ ; pulse 194; respiration 120. In ten minutes temperature  $103\frac{3}{8}^{\circ}$ ; pulse 210; respiration 116. The skin inside of the ears has become of a



livid-bluish hue, and the main vessels of the ear are dilated. The irides are widely dilated, and the conjunctiva flushed, especially the limbus conjunctivæ corneæ. In half an hour temperature was still  $103\frac{3}{5}^{\circ}$ ; pulse, 224; respiration 168. In one hour and a half temperature had fallen to  $102\frac{3}{5}^{\circ}$ . The animal when placed on the floor hopped slowly around, smelling at the pieces of cabbage and carrot which were lying there, but not eating them.

In all these experiments the pulse, temperature, and respiration were determined repeatedly by my assistants, as well as by myself. In the two last the rapidity of the pulse and respiration at the commencement was abnormal and caused by the violent struggles of the animals endeavouring to get away and the fear of pain caused by the incision in the skin of the back; but the marked difference in the frequency of respiration in the two dogs after the same dose of duboisia, when they were fully under the influence of the drug, is worthy of note, and is probably due to the fact that in the small terrier the  $\frac{1}{12}$  grain was sufficient to overpower the respiratory centres, while in the animal four times his weight, it only served to stimulate them.

*Expt. 4.* A four-grain solution of sulphate of duboisia was dropped into the eye of a pigeon, but I could observe no dilatation of the pupil from it. The  $\frac{1}{12}$  grain was subsequently injected under the skin of the back without appreciable effect, either on the pupils or on the bird. It could still fly, stand, and walk as usual, and in half an hour, when tossed out of the window, flew quietly upwards, and perched on the roof of the building.

*Toxic Effects in Man.*—Soon after commencing the use of the drug I was induced, by the hope of tearing some old and tough posterior synechiæ, which had resisted the action of an eight-grain solution of sulphate of atropia, to try what could be effected by the application of sulphate of duboisia in substance to the conjunctiva.

*CASE IV.*—By means of a number one Bowman's probe I succeeded in placing a small ball of the viscid material, about half a millimetre in diameter, in the lower cul-de-sac of the conjunctiva. It caused no irritation or pain, but the patient complained of being dizzy, and feeling as if the room was going round. This soon passed off, and there was no further disagreeable effect. It failed, however, to tear the adhesions between the iris and the capsule.

Encouraged by the way in which the application had been borne in the case just stated, I determined to try it in a case of mixed astigmatism, in which, after several instillations of atropia, the results were still unsatisfactory.

*CASE V.* The patient, J. W., was a healthy girl of 18 years, and, as in the previous case, an exceedingly minute piece of the sulphate of duboisia in substance was held for a few moments in the retrotarsal fold of the lower lid until most of it was melted; the probe was then withdrawn, and the superfluous tears saturated with it pressed out of the eye, and received in a soft handkerchief. A few minutes after, I called the patient to examine the state of the pupils, and she complained of feeling dizzy, and very soon after my attention was attracted by the dark flush of her face.

She was then mildly delirious, pulse 132, and was laid on a sofa. She had a tendency to pick at surrounding objects, and had one or two slight drawings up of the arms, and was very restless. A thermometer under the tongue, when the pulse was most rapid, showed a temperature of  $100\frac{1}{2}^{\circ}$ . No treatment was instituted, and in an hour and twenty-five minutes the pulse had fallen to 100. She now became again more excitable, and tried hard to get up off the sofa. On being told to keep quiet, she would at once lie down again, but in a few moments more again try to rise and move off. A subcutaneous injection of  $\frac{1}{8}$  grain of sulphate of morphia was now given, and in about twenty minutes she went gently to sleep. An hour later, she was roused to be conducted to her bed in the upper ward, and was able to walk upstairs with but little assistance. She again fell asleep, and about half an hour subsequently awoke rational. The nurse reported, however, that once or twice during the night she got up out of bed, but lay down immediately on being admonished by her. Next day she had entirely recovered.

*Therapeutic Uses of Duboisia.*—The foregoing experiments would indicate that we have in duboisia an agent similar in its action to atropia, but in some respects more energetic, and the previously quoted experiments of Ringer showing how promptly it stops the sweating induced by pilocarpine, and those of Gubler (*Gazette Hebdomadaire*, 3 Mai, 1878, p. 285), demonstrating its action in the night sweats of phthisis, would lead us to suppose that its range of therapeutic uses would be similar. As regards its local effects on the eye, its greater promptness of action, and the greater rapidity with which the dilatation of the pupil and the paralysis of accommodation caused by it pass off, render it superior to atropia for use in determining the refraction; while, on the other hand, its greater tendency to produce constitutional disturbance should cause it to be carefully used. Although the above case is the only one of poisoning by it which I have seen, nevertheless nearly every patient in whose eyes I have dropped a four-grain solution of it has complained of dizziness within a short time after its instillation, and this is usually noted when they rise from their chair, either to walk about the room or to go into the street. They do not, however, complain as much of dry throat as those treated by atropia.<sup>1</sup> In trying to tear loose posterior synechiae, I have been much disappointed in its action, and where they had previously resisted the persistent use of atropia, have uniformly failed to increase the effect by the employment of duboisia.

On the other hand, I have had much satisfaction in its use in two cases where atropia called forth marked conjunctivitis. One of them was a severe iritis, and one a case of cataract, where, owing to capsulitis follow-

<sup>1</sup> Seely, in the *Cincinnati Lancet and Clinic*, Feb. 15, 1879, calls attention to a case where a four-grain solution produced faintness and "strange" feelings; and Gubler (*Gazette Hebdomadaire*, 3 Mai, 1878, p. 285) mentions the dryness of the throat, acceleration of the pulse, and redness of the skin, caused by a subcutaneous injection of a milligramme of it, and comments on the loss of power in the lower limbs of his patients and an inability to stand and walk not produced by an equal dose of atropia.

ing extraction, it was extremely desirable to maintain dilatation of the pupil. Both of these did well under the use of sulphate of duboisia.<sup>1</sup>

PHILADELPHIA, March 1, 1879.

### ARTICLE XIII.

INTERNAL USE OF QUINIA IN CYSTITIS. By D. B. SIMMONS, M.D.,  
Surgeon-in-Chief to Ken Hospital, Yokohama, Japan.

SINCE communicating to the American Journal (see number for January, 1877, p. 107) my experience with quinia as a sedative to the neck of the bladder, I have made some trials of it in affections of the viscus itself, with the most satisfactory results. The relief obtained by it in the following case has been so striking that I venture to give it somewhat in detail.

C., æt. 67, residing some twenty miles out of town, sent for me to relieve him from what he supposed to be retention of urine. I found, however, that it was a severe case of cystitis, of long standing. An ordinary silver catheter passed readily, showing that there was no considerable narrowing of the canal, though the urine passed slowly, and in a small stream. The prostate was no larger than is often met with at this age without giving inconvenience. As he had been passing blood the day before, I suspected stone or some tumour of the bladder, but a subsequent careful examination only gave negative results. What he suffered most from was an almost constant desire to micturate, and a burning pain along the urethra. His urine was very fetid and clouded by muco-purulent matter. He had had no sleep for several nights, and was much exhausted by the absence of it and by his intense suffering. I advised him to enter my hospital, which he consented to do the following day.

As the case was coming under my control, I resolved to try the quinia treatment to the exclusion of all other, including the time-honoured "diluent drinks." I accordingly prescribed two 12-grain doses of the drug, in perfect solution, four hours apart. Though most of the journey to the hospital was by water, he was a good deal jostled about, and as he had told me that even moving about the house increased his sufferings, I did not anticipate any especial results from the quinia which I had ordered. To my surprise, however, on visiting him a short time after his arrival in the institution, I found him not only not worse, but somewhat better than on the day previous to leaving home. The vesical tenesmus and pain attending it were less acute. The rapidity with which this had been accomplished, I then and now attributed mostly to the *sedative effect of the*

<sup>1</sup> Since writing the above, I have received the *Lancet* of the 15th February, 1879, in which Soelberg Wells treats of spasm of the accommodation and the use of sulphate of duboisia. In this Mr. Wells details a most interesting case of spasm, which was not relieved by atropia, but yielded to the use of duboisia. In cases where there is no spasm, he says that the pupil is dilated ad maximum (4 gr. sol.) in from ten to twenty minutes, and the accommodation paralyzed in from twenty to forty minutes—this lasting from three to four days. He moreover states, "that duboisine acts more rapidly and powerfully in dilating the pupil, and tearing through any existing posterior synechiæ." As regards the tearing of synechiæ, this is quite at variance with my experience as above detailed.

*quinia on the neck of the bladder*, which was so markedly shown in the case previously reported under that head. I ordered the quinia to be continued, but in 10-grain doses, three times a day.

On the second day, both the patient and his attendant called my attention to the fact that the urine was less offensive and less cloudy than it had been for some time. From this time all his more distressing symptoms rapidly diminished, and now (the twelfth day of the treatment) he passes his urine but two or three times during the night, and as often in the day, with comparatively little pain or inconvenience.

I can hardly think this and another case in which I used the quinia with such good results mere coincidents, as every one knows that senile cystitis, with or without enlarged prostate or stricture, does not often show a very admirable tendency to get well under any treatment, much less without it. Besides, my own cases are not the only ones in which the quinia treatment has proved satisfactory, as my colleague, Dr. Stuart Eldridge, to whom I suggested the use of the drug in this disease, has, in the only two cases in which he tried it, obtained results equally favourable.

Though it may be claimed that this mode of administering quinia gives no better results than by its injection into the bladder, it has this advantage, that it is much more easily administered. The mode of action of the quinia is no doubt the same in both methods, viz. "by its power of arresting or preventing putrefactive fermentation" in the urine, as, according to Dr. G. Kerner, 70 per cent. of the drug is eliminated by the kidneys in from three to twenty-four hours.

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#### ARTICLE XIV.

ON CARBOLIZED JUTE AS A WOUND-DRESSING. By ROBERT F. WEIR, M.D.,  
Surgeon to the New York and Roosevelt Hospitals.

IN the use of Lister's carbolized cotton gauze several objections are found, which materially interfere with the more general use of this dressing in the treatment of wounds. The disadvantages are, first, the difficulty of its manufacture. This of itself often prevents a surgeon, unless living within reach of a large city where the gauze is most likely to be made, from undertaking a trial of the dressing, or is a reason for his not continuing it even when once resorted to.

Without having some impregnated gauze on hand, it is evident that recourse to the antiseptic treatment is not readily to be had; for, the use of lint, muslin, cotton, or other substances, impregnated with a watery solution of carbolic acid, is, by reason of the rapid evaporation of the acid (95 per cent. at the temperature of the body in the course of twenty-four hours), very unreliable; indeed, when such contingencies arise, carbolized olive oil (1-20) makes a much more serviceable dressing, and should be employed. Another reason for discouragement in the use of the

gauze comes from the frequent inability, for anatomical reasons, to secure this dressing properly *in situ*. Such difficulty exists, for example, about the male genitals, where it is necessary to leave an opening in the dressing for the penis to emerge; also about the groin; also on the upper part of the chest walls, or in the axilla, as after mammary ablations, etc. Although any gaping of the dressing is remedied to a certain extent by the use of rubber bandages lightly applied, by fastening the edges of the dressing with collodion, or by stuffing in salicylized cotton, yet those having experience in the Lister method will admit that more care and anxiety are demanded in connection with such cases than in injuries elsewhere located. The third objection is the expense of the carbolyzed gauze.

Now these objections are well met by the use of the carbolyzed jute. Jute, as is well known, is the inner bark of a Bengal plant, the *corchoris capsularis*, and is an extremely absorbent substance. It has been salicylized and used with a certain success by Thiersch; it has also been used by Bardeleben in the form of large masses or "cakes," dipped in an aqueous solution of carbolic acid. But it is only recently that a way of impregnating it, or the like substance, tow, with carbolic acid, has been found, and for this improvement we are indebted to Münnich, a German surgeon, who, in the *Deutsche Militairärztliche Zeitschrift*, No. 10, 1877, published an article, not only setting forth how this could be done, but also sundry advantages accruing from the use of prepared jute in military surgery.

The trouble that has hitherto been experienced is to properly proportion the amount of resin necessary to cause the *slow* evolution of the carbolic acid, and yet to prevent the jute fibres being gummed together into a sticky mass. Prepared, however, by the following formula, Münnich accomplished the successful solution of the question.

He takes for 1 lb (500 grammes) of jute—

50 grammes	(3xiiij)	of carbolic acid,
200 "	(3l)	" resin,
250 "	(3lxiij)	" glycerine,
550 "	(3exxxviiij)	" alcohol.

These are mixed together in the following manner: The finely pulverized resin is first dissolved in the larger part of the alcohol with the aid of heat gently applied; after cooling this the carbolic acid, which has been dissolved in the remaining portion of the alcohol, is added, and, after some minutes, the glycerine. The solution is then poured on the jute and worked up with it, so as to thoroughly moisten all its fibres, and when the mass begins to adhere together, from evaporation of the alcohol, it is carded or pulled apart, and spread out to dry. The carding, which is to prevent the adhesion of the fibres, becomes very easy if fifty grammes of stearine are dissolved with the resin and added to the mixture. But in this case the jute dries somewhat more slowly. Münnich further states that, without the addition of the stearine, the jute will dry in four hours,

and will be ready for use in from twelve to eighteen hours thereafter, and that it will keep best when strongly compressed, wrapped in parchment paper, and placed in a closed box. A good preparation should be entirely homogeneous, have a strong carbolic odor, and the fibres should not be moist, nor adhere on firm pressure.

Jute prepared in this way, without the stearine, I have used in the Roosevelt and New York Hospitals for nearly a year, and, up to the present time, it has been tried in 67 cases of various injuries and operations, viz.: Amputation of leg, 3; compound fractures (arm and forearm), 2; compound fracture of skull, 2; compound dislocation of elbow, 1; resection, elbow, 1; amputation of breast, 5; removal of other tumours, 6; abscess, 9; necrosis, 5; incised wounds, 4; lacerated or gunshot wounds, 11; hydrocele, Volkman's operation, 2; varicocele, 4; hydronephrosis, lumbar section, 1; suture of tendon, 1; lacerated fingers, toes, etc., 10.

During this trial it has fully met all the requirements of an antiseptic dressing. As prepared on the basis of a 10 per cent. strength, it has been found that some loss of carbolic acid occurs during the evaporation of the alcohol, and its strength, after drying, is given by Münnich at 8 per cent., but some analyses which I have had made showed that it often ranged as low as 6 per cent. This compares favourably with the strength of Lister's impregnated gauze, which contains 5 per cent. of carbolic acid. The clinical tests to which the jute was subjected in the treatment of the above-mentioned injuries, have corroborated satisfactorily those instituted in the laboratory by Münnich: he found, for instance, illustrative of the effect of resin in holding back the evolution of the carbolic acid, that in jute corresponding in height to the sixth or seventh layer of a gauze dressing, after it had been applied to a wound for a space of seven days, the loss of carbolic acid was only 3.5 per cent. In this respect it is also interesting to know that the carbolized jute, kept either in a box or covered by parchment paper, showed after six months only a loss of 3 per cent., and that Lister's gauze, eighteen months after its manufacture, retained as much as 3.8 per cent. of carbolic acid in its meshes. Hence we have obtained data that render it justifiable to preserve a stock of the antiseptic material on hand, provided that it be kept strongly compressed, if jute, and tightly folded, if gauze, and in both cases that it be wrapped in oiled silk or rubber cloth, and stored in a box in a cool place.

Jute is used now in the above-named hospitals in the place of the carbolized gauze; instead, however, of omitting the protective, as Münnich does, this is laid as usual over the line of incision, and over it the jute is applied in a layer one or two inches thick, but extending to the same distance from the wound as in the gauze dressing. The rubber cloth or mackintosh, used by Lister to cause the secretions to flow towards the edge of the dressing, as well as to hinder evaporation, is placed over the jute and secured by a bandage. Sometimes the jute is placed between

two layers of gauze, and underneath the outer one the mackintosh is inserted. This dressing fits with snugness, is very absorbent, differing in this respect from oakum or tow, which collects, as is well known, the discharge on the surface, and not only is readily made, but is very cheap. This latter item is particularly of importance in connection with the employment of antiseptic dressings in hospitals. In reality, the cost of the Lister dressing is of serious moment, and is now occupying the attention of the governing boards of a number of the institutions in which its use is rapidly and satisfactorily increasing. The cost of the impregnated gauze varies from six to eight cents a yard, manufactured in the hospital; the cost of the carbolyzed jute is fifty cents a pound (plain jute costing from the importers, Dolphin Manufacturing Co., 65 Duane St., New York, eight cents a pound); by observation it has been ascertained that a pound of jute will in large dressings, as for amputations, compound fractures, etc., go as far as eight to ten yards of gauze, and in small dressings it will go much further. The saving is apparent. But through the kindness and skill of Mr. Rosenwasser, apothecary to the New York Hospital, I have been able to make a preparation of carbolyzed jute of the strength of 7.2 per cent. of acid, after drying, that costs but fifteen cents per pound. This is accomplished mainly by the use of benzine instead of alcohol in its preparation.

The formula is as follows: for 1 lb (or 7000 grains, avoirdupois) of jute take—

Crystallized carbolic acid	.	.	.	.	.	700 grains.
Paraffin	.	.	.	.	.	700 "
Resin	.	.	.	.	.	2800 "
Benzine	.	.	.	.	.	3 pints.

Or, in other words, for a pound of jute—10 per cent. of carbolic acid is required, 40 per cent. of resin, and 10 per cent. of paraffin, with enough benzine to thoroughly moisten. The larger the quantity of jute impregnated at one time, the smaller in proportion is the requisite quantity of benzine.

I annex the *modus operandi* of Mr. Rosenwasser:—

The resin, in coarse powder, is first dissolved in the benzine; the paraffin, broken up in small pieces, is added; and then the carbolic acid (which must be free from water), previously melted by placing the bottle containing it in hot water. The various solids dissolve readily in the cold benzine. The whole operation should be done in a room in which no gas-light, or flame of any kind, is allowed. The benzine used should, preferably, be that sold as 74° deodorized gasoline. Any receptacle that will answer to pack the jute in tightly, and allow the liquid to percolate through, with a stop-cock or other attachment to draw off the liquid from below, will answer; for small quantities, such as a pound or less, an ordinary tin percolator answers; for larger quantities, an oil can open above, or an old barrel with its head knocked out, with a faucet below, will answer.

The jute having been sufficiently picked to insure an even and regular

body, is packed as tightly as possible into the percolator, and the prepared benzine solution poured on from the top, and what has not been absorbed allowed to drain from the faucet into a receptacle below. This is poured on the top again and drained, and again poured on, till all the liquid has been absorbed. The jute is then taken out of the percolator, and the threads partially picked and spread out to dry, either in the open air or in a room suitable for drying by means of cold draughts of air. The inflammable nature of benzine renders it necessary to use extra caution in making large quantities at a time, and, whenever practicable, drying in the open air should be preferred.

There being more liquid than quite sufficient to moisten the whole of the jute, the carbolic acid and resin are more evenly distributed than by the formula of Münnich, who uses so small a quantity of liquid that it has to be sprinkled over parts of the jute and mechanically distributed over the rest, so that a few threads will have a larger percentage of carbolic acid, while the rest will get only that little they can obtain by proximity to those already surcharged with the mixture.

Notwithstanding the great economy in this last method of preparation, yet, for the use of the country practitioner, the formula of Münnich is to be recommended. If jute cannot be had, gauze or mosquito netting can be substituted, but such impregnation, while reliable, is not so good as that originally set forth by Lister.<sup>1</sup>

NEW YORK, February 20, 1878.

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#### ARTICLE XV.

A CASE OF MASTOID ABSCESS FOLLOWING SUPPURATION OF THE INTERNAL EAR; ARTIFICIAL PERFORATION OF THE MASTOID PROCESS. By J. W. WAUGHOP, M.D., of Olympia, Washington Territory.

MRS. T., aged 43, wife of an army officer, after a succession of colds in the head, was suddenly attacked May 1, 1878, with a violent pain deep in the right ear. When called to see her the suffering was so intense, and the auricle so swollen, that it was impossible to bring the membrana tympani into view with the speculum. But little relief was obtained from the internal administration of opiates and other soporifics, and the use of soothing and anodyne applications within and about the ear, until the third day, when matter began oozing from the meatus auditorius externus. The discharge was evidently from the internal ear, as air could be forced out with a hissing noise by attempting to blow the nose with the mouth and nostrils closed, showing that the membrana tympani was perforated. Although the discharge was free, complete relief was not obtained. The auricle was still swollen, with a black sphacelus the size of a dime on its anterior superior margin, which came without apparent cause. The general health was evidently not very good, being impaired by the malaria of Fort Walla Walla, where she had recently been living. And to still

<sup>1</sup> See Antiseptic Surgery and its Results, N. Y. Med. Journ., Dec. 1877-Jan. 1878.



further complicate matters, pregnancy was present, advanced to the beginning of the sixth month. By the fifteenth day, under the daily use of the syringe for washing out the collected matter, both from the meatus and through the Eustachian tube, the severity of the symptoms had passed away, and the patient was able to sit up a little. But from the first there was more or less tenderness about the mastoid process, which would not yield to treatment—blisters, poultices, anodynes—and by the twenty-fourth day, notwithstanding the discharge from the ear was copious, the skin over the mastoid had become swollen, tense, and red, and the pain intolerable.

To alleviate the suffering an incision was made the full length of the process down to the bone, which gave immediate and marked relief for two or three days. But as the agonizing boring pains returned with, if possible, increased severity, the patient, on the thirty-fourth day, was etherized by Dr. Ostrander, when I bored into the mastoid cells with a Brainard perforator, three-sixteenths of an inch in diameter. The site of the operation was in the line of the incision already made, on a level with the upper margin of the meatus auditorius externus, and about half an inch behind the attachment of the auricle, as recommended by Prof. von Tröltsch in his *Treatise on the Ear*. The cells were readily reached, but much to my disappointment no matter flowed, being shut off by some bony septum. Cautious about thrusting the perforator too deeply into the cells, lest unhappily I might reach the brain, I contented myself with moderate probing, believing that the matter would soon find the opening I had made through the external shell of the mastoid. And I was not disappointed in this belief, for on the next day, after increased swelling of the adjacent soft parts, pus began to flow, attended with great relief. By the fortieth day there was very manifest improvement. The artificial opening discharged for eighteen days, when it healed over, and remained healed for three weeks, when, after slight inflammation, it began discharging again, and continued to do so for three weeks, when it finally closed. The discharge from the ear was profuse, always laudable pus, and continued from May 3d to the 7th of the following August, when it also ceased.

The treatment, besides that addressed to the general health, was the daily washing out of the ear with warm water, to which was usually added soda, as recommended by Hinton in Holmes's *System of Surgery*, and, by putting a rubber ring on the nozzle of the syringe to prevent the outward flow, forcing the water and remaining pus and mucus through the Eustachian tube into the pharynx. After the washing, carbolized glycerine, solutions of tannin, white precipitate, and other astringents were thrown into the ear, and the orifice kept closed with a bit of cotton. After the lapse of two months, when the pains and aches of the ear and parts adjacent had largely passed away, to stop the secretion of pus, French chalk was puffed into the ear with a syringe so as to cover the secreting surfaces. The discharge began to diminish at once, and continued to do so gradually, until it ceased wholly, fourteen weeks from the beginning.

During the progress of the case, the patient had to endure the additional discomfort of two crops of small boils, generously covering the posterior portions of the thorax.

Coincident with the cessation of the discharge was that of ability to force air out of the ear, and upon examination with the speculum the membrane was found entire, and the hearing power almost fully restored.

During the progress of the case I was never able to obtain a good view of the membrane, although the attempt was frequently made, and now, five months after closure, when it can be distinctly seen, no certain trace of the aperture can be found. The membrane seems normal.

Three weeks after the ear had finally ceased to discharge, on August 30th, the patient was delivered, after a remarkably easy labour, of her sixth child, a fine healthy boy, concerning which she facetiously inquired, as soon as it was born, "Has it got the earache?"

This case is reported to call attention to the artificial perforation of the mastoid, which I suppose is a rare operation. Hinton, in Holmes's *System of Surgery*, edition of 1870, page 315, says: "There are now nearly twenty cases on record in which the mastoid process has been trephined, or otherwise perforated, for the evacuation of matter contained within it. Of these it may be said that almost every one appears to have been successful that was not performed too late." Toynbee, in his work on the ear, edition of 1860, page 360, says: "I have never performed this operation, but I should not scruple to do so in a case where the life of the patient was threatened"—which condition must have frequently arisen in his practice, as he gives numerous cases in his work which terminated in death from this fatal disease. I am sure the life of this patient was threatened, and I am so pleased with the result that I should not hesitate to perform the operation again, should I have a similar case.

OLYMPIA, W. T., Jan. 6, 1879.

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#### ARTICLE XVI.

##### TREATMENT OF DIPHTHERIA BY CARBOLIC ACID AND IODOFORM.

By J. N. GARNETT, M.D., of Columbia, Missouri.

THE treatment of diphtheria by the topical application of carbolic acid and of iodoform has proven so successful in my hands and those of my partner, Dr. B. A. Watson, and of a number of my professional friends who have used it at my suggestion during the recent severe epidemic in our city and vicinity, that I feel justified in recommending it as worthy of trial.

The principle underlying the treatment is the destruction of the false membrane by the careful application of a caustic solution of carbolic acid in glycerine, and rapidly subduing the œdema by lightly brushing over all the swollen parts with the same remedy; and then the direct application of iodoform to any abraded or ulcerated spots, to heal the broken surface, to act as antiseptic, and to allay the pain, irritability, and extreme sensitiveness of the diphtheritic inflammation.

The carbolic acid should be applied with a camel's-hair pencil, under the light of a mirror. The strength of this solution should be proportioned to the thickness of the false membrane, the object being its complete destruction and removal. In cases seen early, a solution of equal parts of carbolic acid and glycerine will answer well. Generally, in twelve hours after applying the acid by a careful manipulation with the brush, the whole of the false membrane can be removed. By using the camel's-hair pencil and freeing it of the superfluous liquid, the whole of the inflamed and swollen parts can be beneficially brushed over with it, but on the false membrane it should be used more freely, and, if it is thick and heavy, in a more concentrated form. The iodoform, reduced to an impalpable powder, should be blown into the fauces through a glass tube. The tube can be made to take up a sufficient quantity by dipping it several times in a vial containing the iodoform. All the ulcerated or abraded surfaces should be completely covered and the patient ordered to avoid unnecessary swallowing, hawking, or other movements calculated to disturb the coating left in the fauces. Of course, some attention should be paid to the dose of iodoform thus introduced into the system. It is best to apply these remedies sufficiently often to fulfil the indications mentioned. Where false membrane shows a tendency to rapid formation, I have used them three times a day for several days in succession.

In all cases we are in the habit of giving a mercurial purge occasionally during the first stages, and quinia and iron during the decline of the disease. I was induced to try the above plan of treatment in diphtheria from the unsatisfactory results obtained from the methods in common use, and by having witnessed the great benefit to be derived from the subcutaneous injections of carbolic acid in phlegmonous erysipelas, as recommended by Hüter, and its discutient effects in carbuncles and boils when applied concentrated to the surface.

Professor J. H. Duncan, of the Medical Department of the State University of Missouri, in an article on the "Pathology and Treatment of Diphtheria," published in the number of the *Linton District Medical Journal* for January, 1878, gives this as *the best* treatment, and his positive and strong endorsement is the result of personal experience as to its value, it having been successfully used in his own case, at my suggestion, during a recent and severe attack of diphtheria.

## REVIEWS.

ART. XVII.—*Parliamentary Commission. Lunacy Laws. Report from the Select Committee on Lunacy Law; with the Proceedings of the Committee.* Ordered by the House of Commons to be printed, 28 March, 1878.

IN none of the psychological inquiries of the time have we found any attempt to discover the law which regulates the popular movement that takes its final expression in some acts of legislation. At first blush it would seem as if every law of the State originated in some public or private necessity too strong and too obvious to be overlooked or misunderstood, but one needs not to have lived to extreme old age to have observed that much of our legislation has been borne in upon us on waves of public sentiment, as tumultuous, as frothy, as irresistible, as the waves of the sea. It strikingly represents the currents of feeling prevailing at different periods, and is full of historical significance. For many years together in the early part of the present century, no member of the Great and General Court of the old Bay State thought the claims upon his service fully answered without advocating some new law respecting the militia, or the taking of ale-wives in Taunton River. In later times the legislative thought has been particularly expended upon ordinances ever new for the suppression of intemperance, and has filled the statute book with countless enactments touching the rights and property of married women. The American people have a passion for making laws, and no member of a legislative body would feel that he had done justice to himself or met the reasonable expectations of his constituents, if he failed to bring forward some project eminently necessary to promote the welfare of the race. If he have no axes of his own to grind, he will be furnished with plenty of material by those restless beings who live and die in the belief that all their pet grievances can be relieved by an act of the Legislature.

For the past few years, this proclivity for regulating everything by law has been manifested, in many parts of our country, on the subject of the insane and whatever is connected with their custody and care. It seems as if every amateur philanthropist, looking around for objects worthy of his benevolent designs; every member of that abounding class who have an eye only for the shortcomings of institutions and of the men and women who are intrusted with their management; every aspiring candidate for distinction who conceives that he has been slighted by some of their officers; every quondam inmate of them, who, improved enough in their wits to obtain their liberty, but with hearts full of unkindness towards all who had any part in once depriving them of it: such persons, one and all, fill the air with complaints against hospitals for the insane, and clamor for new legislation respecting them.

In Great Britain a similar state of feeling has sprung up, and given rise to a formidable amount of legislation. But all this has failed to satisfy a class of people, as obtrusive and noisy abroad as they are here, who are

satisfied with nothing but endless agitation. And so the House of Commons, in the session of 1877, appointed a committee "to inquire into the operation of the Lunacy Law, so far as regards the security afforded by it against Violations of Personal Liberty." The attention of the committee, they say, was mainly directed to three questions.

"First, whether a possibility exists of persons being unduly deprived of liberty by means of a false allegation of lunacy.

"Secondly, whether persons properly detained are placed under restraint of a nature calculated to retard their cure and consequent discharge.

"Thirdly, whether undue obstacles are opposed to their release when restored to sanity."

On these questions a cloud of witnesses was heard—Commissioners in Lunacy, Chancery Visitors, officers in hospitals, physicians, and quondam inmates of asylums. The inquiry took a wider range than might be implied by these questions strictly considered, and much of it referred to local laws and practices of little interest to us. We need only notice those matters in which we are as deeply concerned as the English are.

The first thought suggested by this proceeding is one of surprise that, in view of the multiplicity and rigor of the existing laws, embracing, it would seem, every possible contingency, and enforced by the severest penalties, it should have been deemed necessary or desirable. It only shows how a legislature may be forced into measures by the persistent pressure of people who run wild with a grievance, and succeed in infusing some of their ardor into a few well-meaning, but credulous and inconsiderate members. This explanation was abundantly confirmed by the result of the investigation, for it will appear that with a few exceptions of minor importance, the commission did not see fit to recommend any change in the existing laws. Either the allegations put forth as grounds for additional legislation were not established by the evidence, or the proposed objects were met by such a diversity of opinion as to prevent all interference.

As to the main question, whether, as a probable fact, sane persons could be deprived of their liberty under the pretence of insanity, the evidence was remarkably satisfactory. Some of the witnesses who had been committed to asylums, were loudly confident that they had never been insane, and consequently, that their confinement was an outrage. Others, while admitting that they had not been exactly right, contended that their confinement in an asylum was needless, and therefore an outrage. Others complained that they were kept long after they had recovered, and had suffered grievous ill by this protracted detention. Besides these, whose evidence seems to have made little impression on the commission, no other witness adduced even a single instance of wrongful confinement, and the general sentiment among commissioners and witnesses was, that such cases must have been extremely rare. Mistakes had been occasionally made where opportunity was wanted for sufficient investigation, persons being committed to an asylum who were labouring only under delirium tremens or some other temporary cerebral ailment. One might suppose that with such experience the laws might have been regarded as affording all the protection that could be reasonably expected from human enactments. Under the vague apprehension that men entrusted with a certain duty would be strongly disposed to abuse their trust, various additional safeguards were suggested. Among them was that of a board of experts, consisting of persons having some practical acquaintance with insanity, who,

alone should have the power of granting medical certificates. This idea has met with some favour in this country, and in one State, at least, a serious attempt has been made to have it provided by the legislature. Although we do not apprehend with Lord Shaftsbury, that such a board would, in the end, "shut up people by the score," yet it is so obviously impracticable that it scarcely deserves serious attention. To bring it into something like an easily working condition by making its number large, and consequently, its members conveniently accessible, would, to that extent, defeat the purpose of its creation. One of the commissioners favoured the plan of vesting in some public functionary the ultimate authority for consigning a person to an asylum, as is done in Scotland where certificates of insanity must be submitted to the sheriff and countersigned by him to make them available. No doubt this course would ensure their being made in proper form and by proper persons, but it is not very obvious how it can affect the question of the mental condition of the person concerned. Either it must become a mere matter of form, or involve the necessity of the sheriff himself examining the patient in every case. If the latter, it is hardly supposable that he would often, if ever, dissent from the physicians. We are a little surprised that no mention was made in this connection of a trial by jury, for among all English speaking people that is popularly regarded as the great bulwark against infringements of personal liberty. To treat a person, guilty only of being visited by an attack of cerebral disease, like one charged with some criminal offence, would produce a smile were it not restrained by a sense of its conflict with every idea of social propriety, and especially of its immediately mischievous effect upon the patient. Nothing, in fact, could more surely confirm the apprehensions and suspicions that swarm in the mind of most of the insane than a proceeding of this sort. And yet it has been adopted in one or two of our States. The fact illustrates one of those extraordinary phases of public feeling when people cast aside all regard for common sense and time-hallowed usage, and follow the dictates of a woman with a hobby roaming through the land proclaiming the oppressions of the asylums and the wrongs of the insane. It would be only a waste of words to show the inconvenience of such a practice, the cruelty of its operation on the patient and the friends, and its utter inefficiency to prevent the apprehended evil. The results of the experiment as shown in particular instances, may convince its friends of the sad mistake made by such a proceeding, and probably nothing else will.

The existence of insanity being admitted, does the fact absolutely warrant the placing of the patient in an asylum, and if not, under what conditions alone should this measure be allowed? Little was said upon this question, though scarcely inferior in importance to any other in the whole of this inquiry. That great difference of opinion respecting it prevails both among doctors and lawyers, and that this difference gives rise in practice to much embarrassment and trouble, is known to everybody who has paid any attention to the subject. Now, a person committed to a hospital after a most careful and intelligent examination of his condition, and the strong and honest conviction on the part of his physicians and friends of the necessity of the step, may be discharged the very next day by order of any single law judge. To arrive at anything like clear notions on the subject, we must recognize the objects sought for in consigning an insane person to a hospital. If we believe them to be proper—necessary to secure the highest interests of the patient—then we have a

clear, well-defined issue with the courts, who can see only an illegal infraction of personal liberty. These objects, then, are, 1, to restore his reason; 2, to preserve him from personal injury to himself or to others; 3, to preserve him from acts *contra bonos mores*; 4, to preserve him from being ruined by people ready to take advantage of his infirmity by leading him into foolish speculations, or infamous alliances. We contend that any one of these purposes should justify commitment to a hospital, but not so the courts. We are not sure they would always so regard any one of them, except the 2d. Again and again they have decided that danger to himself or to others is the only legal ground for holding an insane person in confinement. In fact, requisite means only are needed to liberate the larger part of the insane now in durance, and shut up half the hospitals in the country. How men of some experience in life can readily recognize the propriety of placing in a hospital one bent on taking his life, while they regard it as a high-handed infringement of the law to thus prevent that more painful moral suicide implied in the sacrifice of honor, honesty, and purity, we know not. Of course, the courts must administer the law as they find it, but it is here not so well settled as to forbid us to admire the moral courage of that distinguished magistrate, the late Chief Justice Shaw, of Massachusetts, who, in a case of this kind, announced his determination to be governed by a higher law—the great law of humanity. And he might have added, the great law of common sense—that law followed by the people of this community, when, one hundred and twenty-five years ago, they prayed the legislature to help them establish a hospital for the insane, many of whom, they say, “are continually wasting their substance, to the great injury of themselves and families, ill-disposed persons wickedly taking advantage of their unhappy condition, and drawing them into unreasonable bargains.” Are we wiser than our fathers? or are we only yielding to the demands of a mawkish sentimentalism about personal liberty? If the objects above mentioned are not provided for by existing laws, let the defect be met by suitable enactments. There is nothing to prevent the legislature from declaring, if it pleases, that any one of them shall be a sufficient warrant for committing a person to a hospital.

In the examination of the Parliamentary Committee, no point excited greater interest than the discharge of patients from confinement. Once it seemed quite enough to provide by suitable laws for their removal to a hospital, it being supposed their discharge therefrom would take care of itself. It was reserved for the present generation to be alarmed by the apprehension that to increase the gains of their keepers, they would be detained long after recovery. True, no case of the kind has ever been clearly proved, certainly not in this country; and before this committee the complaint was made chiefly by those who had been patients themselves. They strongly protested that they had been kept too long; indeed, the most of them were quite certain there was no sufficient reason for their being detained at all. The commissioners failed to see the need of fresh legislation on this matter, nor are we sure that it would relieve us in this country from the troubles that spring from this source. Whether the time has come when a patient can be safely discharged, would seem to be a strictly medical question, and none able to answer it so correctly as the officers of the hospital. He has been under their daily, hourly inspection for weeks or months; they have learned his inmost thoughts and feelings, with the changes of bodily condition connected with them; they have be-

come familiar with his ways and manners, and have observed manifestations of disease which only the practised eye can discern. Their judgments ought to be conclusive, but in the courts they are often overborne by the statements of people—embracing, it may be, the judge himself, who calls the patient to his side, and converses with him a few minutes—who know nothing about insanity, and very little about the individual in question. The fact is ignored, because not known, that the conditions of insanity are often obscure, and that it abounds in phases that may be readily mistaken by the unskilled observer for the unclouded light of reason. Nothing is more common, in the course of the disease, than periods of apparent restoration of reason, the patient becoming calm, lucid, and correct in his ways; but they soon pass away, and are succeeded by the former turbulence and delusion. The medical officers of the hospital are prepared by their experience and training to be able to distinguish, generally, in these remissions, the latent element of disease, which, sooner or later, will take the form of unquestionable disorder. Even they are sometimes obliged to wait patiently for revelations that time only can make. Even when this change is actual convalescence, a period of probation is required in order that it may lead to assured recovery. This is a fact that the patient and his friends are often unwilling to admit. With the customary disregard of prudence in matters of health and disease, they think they know better than the doctors, and are ready to run the risk of relapse by a premature removal. It often happens, however, that there is a difference of opinion in the family councils, or some unscrupulous lawyer has thrust himself into the case, and under the writ of habeas corpus the matter is carried into court. With some experience in this direction, we are obliged to say that we have never known a plain statement of the reasons for further detention, as given above, to prevail with the court. Here the old adage, *Quilibet in suo arte credendum est*, seems to be utterly ignored. How such a complete inversion of the ordinary rules of evidence could have prevailed, is not easily understood. We are reluctant to believe that medical men in charge of the insane are either supposed to be incompetent to recognize the condition of sanity when it returns, because, seeing so much of insanity, living among the insane as they do, they come to regard almost everybody as insane, or are sure to be wrongfully biassed by mercenary motives. It springs, probably, from that misplaced sympathy with the weak and unfortunate, which, with the proverbial result of zeal without knowledge, ends in doing its objects more harm than good. The sequel of such discharges is generally mischievous, though not always so deplorable, thank God, as one alluded to a year or two ago, by a judge in this city, with an honourable record of long and worthy service on the bench, who said that once, yielding to the usual kind of evidence in this class of cases, he had discharged a patient from the Pennsylvania Hospital, and a day or two afterwards learned that he had drowned himself in the Delaware—a fact better calculated to suggest a valuable lesson than to inspire comfortable reflections.

Respecting the present mode of proceeding for placing persons in hospitals for the insane, little or no complaint was made; but there are some things in it we certainly should not recommend for adoption here. The law requires that the physician should state the grounds of his opinion, distinguishing between such as he learns from others and those which come under under his own personal observation; and the statute declares that no person shall be received into an asylum on a certificate founded



only on facts communicated by others. With our experience we cannot avoid the conclusion that in respect to a number of patients not very small, either the statute is evaded, or they are debarred from obtaining the custody and care which they clearly need. In cases of acute dementia or melancholia, where the person is completely silent; or of circùlar mania, where he gives ingenious reasons for his conduct; or of those who, while they entertain delusions, declare they have renounced them; or that larger class, whose insanity is manifested solely in their conduct, while their conversation is correct and rational,—are all such cases to be denied admission to the hospital because the physician, in the hour or two which he gives to the examination, can detect nothing clearly indicative of insanity? Certainly, no one much conversant with the insane can have failed to meet many cases in each one of these forms of the disease. In the treatment of bodily disease, our course is often determined by information derived from the nurse or the family, and it is mostly so when prescribing for children with whom, as being unable or unwilling to describe their condition, the insane may be compared. The rule in question, if adopted in this country, would present one of those curious inconsistencies so common in the prevalent notions and practices regarding the insane. The very physician whose certificate would be rejected because unable to see for himself any manifestations of the disease, is allowed to go upon the witness-stand and pronounce opinions respecting the mental condition of a person on trial founded solely on the testimony given from that same stand—opinions that may settle the question of life or death.

Notice was taken of the admission of visitors to the asylums, and we are glad to find the commissioners saying, “the old system of turning an asylum into a resort of sightseers has happily passed away with other enormities.” We wish *we* could say as much on this matter, but we are obliged to acknowledge, with shame and confusion of face, that our asylums are too much regarded as show places for the indulgence of an idle curiosity. We could mention one in the midst of a community second to no other in culture and refinement, which every week opens its doors to a host of sightseers, before whose curious eyes the assembled patients are brought out to display their mad antics and motley costumes. To those who come with an intelligent interest, and to such only, should this public visiting be allowed, but always restricted by a proper regard to the peace and comfort of the patients.

In nothing connected with the hospital management of the insane is the public more widely and obstinately wrong than in the prevalent notions respecting the visits of friends. It is hard to convince people that a patient may be and often is injured by an interview with a dear relative or an intimate friend. They cannot understand that the principal element in the moral treatment of insanity consists in an entire change of surroundings, whereby all existing trains of association are broken, and the mind is introduced to new persons, new things, new scenes. They will scarcely believe that the figures of a carpet or a wall-paper, or the sound of a familiar voice, are alone sufficient to maintain and foster that intense morbid introspection which, in one shape or another, characterizes almost every phase of mental disease. They are seldom quite reconciled to the refusal of the officers of the hospital to permit an interview between the patient and a beloved friend. And yet, if there is any one thing in the management of patients known to be decidedly mischievous, in most recent cases and in many old ones, it is such interviews. The conversation turns

on matters of the deepest interest, which are vividly brought to mind; the slumbering irritability is revived; and sleepless nights and loss of appetite follow. It is one of the discouraging experiences of the physician of the hospital often to see the improvement effected by many weeks or months of careful management, rapidly vanish after the ill-judged visits of friends which he was powerless to prevent. Hospitals have incurred no little popular odium because this privilege of visiting the patients has been denied to casual acquaintances, impelled only by idle curiosity; and those who suppose themselves possessors of the advanced thought on the subject are in favor of making the hospitals as open to the public as hotels and corner groceries. This notion springs, no doubt, from the vulgar belief that whatever in the management of any institution looks like secrecy we are bound to regard as proof positive of wrong done or intended. Like many other notions respecting asylums, this belief is not amenable to reason, simply because it has no true foundation.

This indiscriminate visiting also gives rise to a kind of mischief little thought of by the world at large, but which is often of the most serious character. The visitor may abuse the opportunity to further some mercenary interest of his own, and induce him to put his name to obligations injurious to his fortune. Even a patient's own family may commit this kind of wrong. We knew a wife to obtain from her husband a power of attorney whereby she sold some city lots, which contracts were disputed years afterwards by the children when they came of age, and much litigation followed. Even a little indiscretion, or lack of proper judgment in dealing with the insane, often leads to most serious consequences. For instance—and these instances are not hypothetical—a casual visitor tells a woman just emerging from the clouds of disease, as an interesting piece of news, that her child died a day or two before; a young man presents his sister, strongly suicidal, with a penknife; and another allows his wife to get possession of his valise, from which she takes his razor and cuts her throat on the spot. Minor offences, such as giving patients articles of food or jewelry, which they ought not to have, of inspiring distrust of their friends and disparaging those who have them in charge, are common enough in every hospital physician's experience. No rules or arrangements can entirely prevent such things, but the public should contentedly bear with all the vigilance and limited access to patients, which alone can make them as harmless as possible.

A little was said on the subject of allowing more liberty to hospital inmates by abolishing locks, bolts, and window-guards. Considering that this movement, as displayed in a certain Scotch asylum, has been hailed as a glorious reform by those worthy people who represent the "advanced thought" on all matters pertaining to insanity, and pressed upon us for our imitation, we are certainly surprised that so little account was made of it. We have no reason to think that the commissioners were aware that the experiment had long since been tried, and its merits and demerits thoroughly tested. We may say here, for the benefit of those who undertake to instruct others, that in most American hospitals it has been the practice, more or less for forty years, to leave some halls wide open, from which the patients can go and come at their pleasure. The commissioners favour the measure in a way that shows they regard it rather as the substance of things hoped for than as the evidence of something much seen.

In the matter of mechanical restraint, notwithstanding the immense

importance attributed to it in Great Britain and the controversy it has excited, scarcely anything was said. This is surprising, for if the good resulting from the system of non-restraint were half as much as is claimed for it, we should naturally have expected to find it fully discussed—its beneficent effects specifically set forth, and opinions for and against impartially received. Probably the commissioners regarded it as a foregone conclusion, and all opposition to it with supreme indifference.

We regret for our own sakes on this side the water that so little came out respecting the proper size of hospitals for the insane, for at present no question touching the care of the insane has a closer bearing on the future of these institutions. The late Sir James Cox, one of the Scotch Commissioners of Lunacy, when examined on this point, stated the case exactly when he said, "My own view is in favor of small asylums. I think when you come to large asylums, the patients are lost in them, and I do not think they are more economical." When asked what he regarded as the proper limit, he replied, 200. Truer words were never uttered, but we dare not believe that such words will dispose at once of the favorite fallacy that the larger the hospital the cheaper its maintenance. It is too much, we fear, like a class of diseases called self-limited. It must run its course independent of reason or arithmetic.

The subject of the correspondence of patients received some notice, the common opinion of the witnesses being that no change was needed, in the present arrangement, which is that all letters thought by the superintendent unsuitable to be sent to the parties addressed, are forwarded to the Commissioners in Lunacy. This disposal of them seems not very complimentary to the discretion of that officer, who might be trusted, we should suppose, to pass judgment upon them, and destroy them if found improper to be sent. It may not matter much with the class of persons found in English public asylums, but people of a higher social standing might justly object to having their foolish letters exposed even to a board of commissioners. This arrangement, however, is not so bad as one adopted in several of our States at the instance of the woman already alluded to. Their respective legislatures having been convinced that the inmates of our asylums are debarred from communicating with their friends and others, and thus become the victims of unutterable wrong, they enacted that letter-boxes should be placed in every hall of every hospital, into which patients might drop their letters, the keys of the boxes being kept by some functionary delegated for this purpose, who should open them at certain periods. The mode of disposing of the letters varies somewhat in different States, but all agree in the common purpose of keeping them out of the hands of the officers of the establishment. In one State it was also ordered, that letters sent to patients should be delivered unopened. Under this benign arrangement a young woman received a quantity of morphia, enough to destroy life, which she had solicited from her correspondent. The promoters of this scheme of letter-boxes were unwilling to learn that it was entirely uncalled for, useless for any proposed end, and sprang from sheer ignorance of the ways and feelings of the insane. As it was a pet measure of the amateur reformers in lunacy, it may be well to see what has come of it.

Dr. Earle, Superintendent of the Hospital at Northampton, tells us in his report for 1875, that from April, 1873, to April, 1874, 7254 letters were sent in the usual way, 1664 by patients, and the rest by officers and employés. After the boxes were put up three only were placed in them

in the course of the year. One was a senseless, incoherent effusion, of a kind very common in hospitals for the insane, and addressed to the doctor himself. In another the writer declares, among many other things, that he is "more manly, angelic, feminine, than all Massachusetts put together," and "two degrees saner than all New England put together." The poor man, no doubt, overrates his perfections. Had he narrowed the range of his comparisons down to the authors and abettors of this postal scheme, we should certainly not have been disposed to question his pretensions. The third letter was addressed to the Secretary of the Board of State Charities, and the doctor never learned its contents.

Dr. Walker, Superintendent of the Boston Municipal Hospital, says: "At the last visit of the secretary to us; he found but a single letter in all the house, and that of no account. In our best wards, no notice is taken of the boxes; and, in the lower wards, they are filled only with chips and bits of paper—mere rubbish!"

The Secretary of the Board of State Charities, who has the control of the boxes in Massachusetts, gives, in his report for 1875, his account of their contents during a period of three months. He says: "The aggregate for all the asylums has been about 75 letters and half a bushel of refuse consisting of bits of almost every conceivable thing the inmates could obtain and crowd into the openings of the boxes. . . . The correspondence obtained has been addressed to persons in almost every rank of life, from the Queen of England and the President of the United States to the families of insane paupers confined at Tewksbury. . . . The letters revealed nothing that demanded investigation."

This is the result of the experiment in a single State, it is true, and we have no statistics of its operation elsewhere, yet as human nature, sane or insane, is much the same all the country over, we presume the story in other States would be very much like this.

The commissioners, in summing up the evidence, say, that "allegations of *mala fides*, or of serious abuses, were not substantiated. Much of the evidence which extended to a great length, amounted to little more than differences of opinion among medical men, questions of liberality or parsimony in the arrangements of asylums, suggestions with reference to the letters of patients and visits of friends, or complaints of hesitation among superintendents and relatives to believe in the perfect recovery of patients." They, therefore, do not recommend any material change of the existing laws. Their mode of commitment is essentially that in use in most of our oldest States, viz., a certificate of insanity signed by two medical men, and an order or application from some relative or other responsible party. There is an adherence to the mere form of the papers—even to the dotting of the i's and the crossing of the t's almost—so rigidly insisted on as to seem, from our point of view, the reddest of red tape. If, for instance, the subject of the certificate is called Mary Anne Jones, the document will be invalidated if in any part of it the name is written Mary Ann Jones. The same thing would follow if the street and number of the person's residence are omitted, or if the person is referred to at all as the said Jones, instead of Mary Anne Jones. Within twenty-four hours after admission, the papers must be sent to the Lunacy Commissioners, and if in the provinces, to the Clerk of the Peace also, by whom they are closely inspected, and many of them returned for correction. In one year, it is said, out of 12,175 certificates received by them, 2314 were returned for amendment. If anything like an adequate compensation is gained by this

marvellous amount of inspection, we cannot see it. Here, surely, the letter killeth.

The distinguishing feature of the English supervision is the Lunacy Commission, composed of six members, appointed by the Crown. Their business is to visit all the hospitals and asylums, public and private, observe all matters of management, of diet, occupation, warming and ventilation, architectural construction, to give advice and suggest improvement, and make an annual report of their observations. Their function is, chiefly, advisory, but it is none the less potent for that. With the exception of one or two members of the Board who have seen some actual service in the care of the insane, they have no special qualification for the duty. They are simply very respectable, intelligent gentlemen, whose claims on the bounty of the Crown are answered by an office with easy service and a comfortable salary. It is a very prevalent opinion, however, that this commission has done good service, and that the present high condition of the English institutions for the insane may be fairly attributed to its counsels and influence. How much foundation there really is for this opinion, is not very apparent. We can easily conceive that a body of men having had some personal experience in the management of these institutions might, by frequent and close inspection, contribute greatly to their improvement. But the members of the English Lunacy Commission, with one or two exceptions, are usually not men of this kind. Many of them, probably, were never in a lunatic asylum, previous to their appointment. To suppose they can be of any practical service is to ignore the common belief that one must understand the subject himself before he is capable of instructing others. The whole number of insane officially known to the Commissioners in England and Wales in 1877, was 66,336, and the number of admissions that year, 12,175. The metropolitan licensed houses are visited six times a year, the provincial four times, and all others (containing more than two-thirds of the whole number) once a year. Each of the six commissioners, therefore, must visit at least 11,056 patients, and the greater part of them but once a year. The visit to the establishment is seldom prolonged, if we do not mistake, beyond a single day. It needs no formal calculation to show that the amount of time devoted to each patient must, on the average, be infinitesimally small. And yet such visits are supposed to be "safeguards against undue detention and neglect." True, the real condition of most of them is too obvious to admit of any question, but of a large proportion their mental condition must be a matter of special inquiry; and how few of them could receive it in the little time devoted to the purpose! But taking the event most likely to happen, that of half a dozen patients accosting the Commissioners as they pass through the wards with complaints of being wrongfully confined, and that too in the most plausible manner, with every appearance of truth, there is matter for many days of patient and intelligent investigation, if this alleged safeguard is to be anything better than a flourish of rhetoric. One can scarcely think calmly of the fearful responsibility thus assumed, for in this class of the insane are to be found those whose bloody deeds, with a steadily increasing frequency, astonish and shock whole communities. Even admitting that a case of undue detention may be occasionally detected by this kind of visitation, a whole year may elapse before it comes to the Commissioners' notice. A considerable increase in the number of the members would relieve the difficulty in a small degree, but to this there is the potent objection of the expense, as well

as another made by Lord Shaftsbury, which we should have hardly expected. He says, in regard to such increase, "we should get into debates, and making motions and divisions, and ten thousand things of that sort."

The report of the Commissioners concerning this or that asylum is not calculated to impress us strongly with the value of their observations, occupied as they are chiefly with the smallest details of the service. We certainly are unable to see what great object is promoted by sending a gentleman to Land's End to ascertain that several of the women were very noisy, while one exhibited noisy tendencies and attempted an attack on the head attendant; that the blankets were getting shabby; that a few more cupboards are needed; that an epileptic was found dead in her bed, and another woman died suddenly from cancer when no one was present; that 18 men were "slops" on account of their faulty habits; that a certain room would be improved by fresh paint and paper; that a female suicidal patient, when out of the attendant's sight two or three minutes, nearly strangled herself with the cord of the window blind, etc.

And as for that great bugbear, so much used of late years to frighten a credulous public—that of sane people shut up in madhouses by means of foul conspiracies between relatives and doctors—we are not aware that the Lunacy Commission have ever detected a single instance of the kind.

We have dwelt longer on this part of the English system than its real importance may seem to warrant, and the reason is that attempts have been made to introduce it into this country. But were the objections to it far less serious than they are, the circumstances are so different as to prevent its suitable working here. In the organization of our hospitals, the general supervision is provided for in a board of directors, whose control is almost unlimited. They are, for the most part, men of good social status, able and willing to perform their allotted duty. They make frequent visits, when they communicate with the patients, notice the condition of the establishment within and without, learn its proceedings, look after its finances, and give counsel and help when required. If sometimes there is found on these boards a person who uses his position to serve some unworthy purpose, or gratify some bad feeling, it only indicates the average style of character which would be likely to appear, of course, in any Board of different shape. A lunacy commission would, undoubtedly, be composed of the same kind of men, with no more general intelligence, and no more knowledge of insanity or of the insane, so that nothing would be gained in that direction. If it is to be engrafted upon the present system as a sort of supplementary agency, it is impossible to conceive of any division of duties that would prevent collision and embarrassment. If, on the other hand, the Commission is to take the place of the present Boards, it must needs be a large one in such States as New York and Massachusetts, in order that it may accomplish any desirable purpose. This implies a large increase of expense, and this, at a time when the whole country is crying out against the burden imposed by the care of the insane, will scarcely find favour with tax-payers. And after all, we do not hesitate to say, no duty whatever could be imposed on such a Commission that would not be equally well performed by the existing Boards.

We trust the results of this Parliamentary inquiry will not be lost upon this country. The questions here are the same, and the movers in the agitation are of the same character. The path of true improvement lies not in the direction of additional legislation, but rather in so elevating

the moral sentiment of the community that it shall insist on having the insane and all receptacles for the insane—whether hospitals, poor-houses, or huge municipal establishments—managed in the spirit of the broadest and wisest humanity.

I. R.

ART. XVIII.—*Recent Contributions to the Study of Glaucoma.*

1. *Ueber das Glaucom.* Von Dr. MAX KNIES, Gräfe's Archiv, xxii. 3; ib. xxiii. 2.
2. *Die Ursache des Glaucoms.* Von Dr. ADOLPH WEBER, Gräfe's Archiv, xxiii. 1.
3. *Therapeutique Oculaire.* Par L. DE WECKER, Paris, 1878.
4. *On the Pathology of Increased Tension of the Globe.* By Dr. W. A. BRAILEY, Royal London Ophthalmic Hospital Reports, December, 1877.
5. *On Glaucoma and Iridectomy.* By Dr. J. SCHNABEL, Knapp's Archives, vol. v. numbers 3 and 4.
6. *Glaucoma Aphorisms.* By Prof. L. MAUTHNER, Knapp's Archives, vol. vii. 3 and 4.
7. *Contributions to the Knowledge of Glaucoma.* By Prof. J. SCHNABEL, Knapp's Archives, vol. vii.

THAT complex of symptoms known under the name of Glaucoma was, until 1856, a "noli me tangere" in ophthalmic surgery, and its pathology a "terra incognita." Speculations in regard to its etiology and the seat of the prime pathological changes were, indeed, rife enough, but most of them were, at least, but plausible conjectures. It was referred by various authorities to each distinct anatomical division of the eye, by some to two or more. The larger number located the essential alterations in the lens or vitreous humour, probably on account of the greenish appearance the pupil presented in the majority of cases. Of its true character it is not known that they had any knowledge. It was reserved for Von Gräfe to point out at once its essential character and the means for its relief.<sup>1</sup>

But, although the essential nature of the affection is better understood since Gräfe threw the light of his genius on the subject, its etiology is almost as much a *questio vexata* as ever it was. The fact that we have a remedy for it has not by any means settled the question of its pathology, and, indeed, the manner in which iridectomy cures the disease (if it really be an entity) serves as the battle-ground on which the conflict of opposing theories is waged. A theory which does not satisfactorily explain the manner in which iridectomy lowers increased tension can have no chance of acceptance.

It must, however, by no means be understood that no important truths have been brought to light by this clashing of opinions. Indeed, many facts have been elicited which are destined to simplify further study, and will be of great value to the future investigator. Truth is only arrived at

<sup>1</sup> Platner (*Institut. Chirurg. Rational*, Leipzig, 1745) was probably the first who noted an increased hardness of the ball in glaucoma. He divided the glaucoma cases into two categories. In one the swelling of the lens caused a pressure on the other parts of the eye, increasing its tension; in the other, the seat of the trouble was in the vitreous. Certainly hardness of the ball had not the same significance to him as to Gräfe.

by the elimination of a great deal of error, and before we come to the true pathology and etiology of glaucoma we shall have, no doubt, to abandon many ideas at present having general acceptance. We should be careful, therefore, to hold our views in a plastic condition ready to take the form which the facts most clearly established warrant, but at the same time accepting it as only provisional. The time for fixedness of ideas in respect to glaucoma has certainly not yet arrived.

Though the subject has attracted marked attention since men began to study human pathology, it has quite recently come forward with much greater prominence on account of the close and accurate examination of a number of glaucomatous eyes that have been removed for various causes. This is, it seems to us, the true beginning of a proper study of the question. What we want in this stage of the investigation is *facts*. We want to know as accurately as the microscope can tell us the exact anatomical condition of an eye that has become glaucomatous. When we have accumulated a large number of observations of this kind, and have at the same time the full clinical history of the cases, we shall be prepared to form a rational pathology of the affection, and not till then.

The titles of some of the papers which have recently appeared treating the subject in this manner we have placed at the head of this paper, but this is far from being the total amount of the literature contributed to the subject during that time. These are, however, sufficient to show how earnestly the field is being worked, and how much has really been accomplished.

Before entering into a study of these papers it may be well enough to refer briefly to the prominent theories that had been held respecting the pathology of glaucoma previously. Ever since Gräfe observed that glaucoma was but another name for increased tension of the ball, pathologists have been mainly divided among three opinions, as to the conditions leading to this increase of tension.

The first is the one put forward by Gräfe himself, and has been designated as the *inflammatory* theory. According to this, the basis of the increased pressure lay in a choroiditis serosa (irido-choroiditis), which caused a hypersecretion of fluid which, not being able to find an outlet, produced a distension of the walls of the globe. All the phenomena—corneal opacity, dilatation of the pupil, excavation of the optic disk, were due to this increased pressure. Those cases of nerve excavation unaccompanied by apparent increased pressure, and first designated by him as “Amaurosis with excavation,” he finally came to look upon as glaucomatous, and considered that the pressure had been very slight, but of long continuance. The *typical* form was the acute inflammatory.

On the other hand, Donders looked upon the *simple glaucoma*, which corresponds to Gräfe’s “amaurosis with excavation,” as the type, and regarded the inflammatory symptoms as intercurrent and as complications. He did not believe that a glaucomatous inflammation had ever been observed in an otherwise sound eye. The cause of the increased quantity of fluid in the eye he considered to be deranged nervous influence, and hence his theory is known as the *neuro-pathic*. The trigeminus he considered to be the nerve which presided over the secretory functions of the interior of the eye. He did not consider the sympathetic to exercise any material influence. The seat of the nervous lesion may be intra- or extra-ocular.

The other theory is known as the *scleral* theory, because the rigidity of



this tissue is looked upon as the principal factor in the morbid process. Hippel and Grünhagen thought that deranged nervous influence produced a thickening of the scleral tissue, which prevented it from yielding to pressure from within. Cusco, who was among the first (1862) to advocate this theory, thought the changes in the sclera due to inflammation. Coccius (1863) considered it due to a fatty degeneration of the tissue with subsequent shrinking. He also attributes some influence to hypersecretion of fluid. Adamüick thought the inelasticity of sclera prevented the outflow of blood through the *venæ vorticosæ*. Stellwag (1870) looks upon the elasticity of the bulb as the regulator of the intra-ocular pressure. Should this become deranged, the pressure must be modified.

Even Gräfe finally (1869) came to regard the rigidity of the sclera as a factor in the production of simple glaucoma by the pressure it exerted on the secretory fibres of the nerves passing through it.

Dr. Max Knies was the first to make anything like an extended report of the conditions found in a number of glaucomatous eyes taken indiscriminately. The eyes examined by him were from the collection of Professor Becker, in Hiedelberg. He went into this examination without a prejudice for or against any particular glaucoma theory. The result of the microscopical appearances of each specimen is given in full, as well as the clinical history of the case, so far as it was obtainable.

In every specimen examined by him, there was found a closure of *Fontana's* space, either by the pushing forward and agglutination of the iris to the periphery of the anterior chamber, or by an inflammatory product. In the larger number of cases he regards the origin of the trouble to be an inflammation around the canal of *Schlemm*.

As *Fontana's* space plays a very important rôle in some of the more recent theories of glaucoma, it may be well to define what is meant by it. Parties are hardly agreed as to the exact extent of surface covered by the term; some limiting it to the "angle of the iris," while others make it embrace *Schlemm's* canal and the parts in its immediate vicinity. *Fontana's* space (*Fontana* himself regarded it as a canal) is not, indeed, to be found in the human eye. The network of loose connective tissue which he described in the eye of the ox, and which is met with in other lower animals, and in the Orang-Outang, is not found in that condition in the human eye, but is represented by the *ligamentum pectinatum*, or iris-angle, which by convention is limited to a portion of the periphery of the anterior chamber, which is bordered inwardly by the termination of the membrane of *Descemet*.

*Schnabel* defines its limits as follows: "If we imagine a cylinder erected in a normal eye, on the basis of a plane passing through the margin of *Descemet's* membrane, and its circumference coinciding with that margin, and if we suppose the surface of the cylinder to stand posteriorly to the plane of the iris, there remains between the surface of the cylinder and the lateral wall of the chamber an annular space, which is limited behind by the iris, in front by the *ligamentum pectinatum*."

*Wecker* says that this space (and that around the optic nerve) are "the only points in the interior of the eye which are devoid of a vitreous membrane which is badly adapted for filtration."

The inflammation around *Schlemm's* canal need not be pronounced to lead finally to the closure of *Fontana's* space. It is present, however, even in the non-inflammatory form. Cellular infiltration of this region was absent in none of the glaucomatous eyes examined by *Knies*. As the result of his examinations, he has come to the following conclusions:—

"1. The essential condition of genuine glaucoma is a gluing of the periphery of the iris to the cornea and an obliteration of Fontana's space. The nerve excavation is to be regarded as somewhat secondary.

"2. The same relations exist also for the so-called secondary glaucoma; only for secondary glaucoma after occlusion of the pupil is the question not yet settled.

"3. The glaucoma-operation [Iridectomy] cannot be supplanted by the ezerine or any other treatment.

"4. Sclerotomy is an exception to this, since an excision of a piece of the iris is not essential. It can, where prolapsus of the iris is not to be feared, be substituted for iridectomy.

"5. The affinity of many glaucomatous processes to glaucoma is shown through corresponding pathologico-anatomical conditions.

"There may possibly be cases where other causes can produce the clinical appearances of glaucoma, but I have not met with them."

In giving this theory a place in the classification, we would style it the inflammatory-mechanical theory, since it is the product of the inflammation which causes the mechanical obstruction to the outflow of the fluids in the eye, on which the increased pressure depends. He at the same time, however, recognizes a nervous influence, particularly for an "outburst" of the glaucomatous attack. All the symptoms—corneal turbidity, iridoplegia, paresis of accommodation, hyperæmia of scleral veins, etc.—he refers to the increased intraocular pressure.

Weber's theory is similar to that of Knies in this, that he recognizes an impeded outflow of the eye-fluid through Fontana's space. In respect, particularly, to the glaucomatous appearances called forth by intra-orbital and intra-ocular tumours, he thinks that the obstruction of Fontana's space is due to a pushing forward of the ciliary processes. A dislocation of the lens by pressing upon and closing up the space can have the same effect. The swelling of the ciliary processes is due to impeded outflow of blood through the *venæ vorticosæ*. According to him, the essence of glaucoma does not consist in an increase of pressure as such, but in the complete lack of self-checking at the time when the pressure has passed the medium degree.

Wecker claims to have been the first to formulate our ideas respecting the pathology of glaucoma, and to look upon it simply as a symptom which was "the expression of an interference of equilibrium between secretion and excretion, with an increase of the contents of the eye and its pressure."<sup>1</sup>

This increase of tension he considers due, not to an increase in the secretion of the eye-fluids, but to a hindrance in the excretion. He, therefore, takes his place among those accepting the mechanical theory; and, like most of these, he looks upon the region of Fontana's space as the principal "filtration way," and any cause obstructing this way as provocative of glaucoma.

In an eye properly "disposed" to an attack of glaucoma, very various and slight causes can cause an outbreak. He even admits that strong emotions by causing a turgescence of the bloodvessels of the eye can be the "last straw" to break the equilibrium between secretion and excretion, and when this is once broken, the increased internal pressure will of itself become a factor in closing up the filtration way, by a condensation of the trabecular tissue of the iris angle.

Schnabel contends that the increase of tension is due to a derangement in the nerves controlling secretion, and, moreover, looks upon the opacity

<sup>1</sup> Archiv f. Oph. xxii. 4.

of the cornea, which others have referred to the pathological intra-ocular pressure, as the result of an infiltration of the cornea with fluid. The following are his words:—

“I believe that the occurrence of the opacity now under consideration is not due to a pathological accumulation of fixed elements in the cornea, but that it is dependent upon the secretion of a turbid fluid; and taking into consideration the course, which evidently shows a dependence of a disease of the nerves, I am forced to regard the periodical opacity of the cornea which we encounter in all the various forms of glaucoma, most frequently in the inflammatory variety, but also in eyes which are not the seat of glaucoma, with or without increase of tension, as a neurosis of the secretory nerves.”

The largest number of glaucomatous eyes examined by one person are those reported by Dr. Brailey in his paper. He gives the microscopical appearances found in fifty-three eyes in which increased tension “had been at some time a symptom.”

He divides his cases into two groups: A, in which the iris was the starting-point of the affection; and B, in which the morbid process had its seat in the ciliary body or choroid. He lays special stress upon the atrophic condition of the ciliary muscle which was found in forty-nine of the fifty-three cases. Even in those cases where the changes began in the iris, the ciliary muscle was in time affected with atrophy. This atrophy, however, he believes to be preceded by a condition of inflammation, since in the cases examined when in the early stages he found a marked increase in the number of the nuclei. He evidently considers the increase of tension to be due, in the first place, to an increased secretion, though, later on, a hindrance in excretion does most likely come into play.

We have certainly here diversity of opinion enough to warrant the conclusion that the question of glaucoma pathology is yet far from being settled. The great importance, however, of most of these communications, as we have said, consists in the fact that the opinions are based on actual observations, and must have their value in the summing up of the evidence for a final decision. Let us glance briefly at these different views, and see how far each is supported by facts having general acceptance.

The view of Knies that the increase of tension is due to an obstruction of filtration through Fontana's space, appears to be supported by the whole of his observations and the greater part of Brailey's. B. says he found peripheral adhesions of the iris in twenty-five cases of the twenty-eight of group A, and in twenty-two out of twenty-five cases of group B; but still he does not look upon this as the prime cause, since it was not present in all cases, and he can readily account for it by the increase of tension pushing the iris forward against the cornea, and in those cases where there is inflammatory adhesion, by the propagation of the inflammation from the ciliary body to the iris. But, when this adhesion is once formed, it can act as a very powerful obstacle to the filtration of fluid. According to his observations, the tissue of the iris is but ill adapted to transudation, as is evidenced in the bulging of the iris when there is a total posterior synechia. The increase of nuclei in the vicinity of Schlemm's canal, on which Knies lays so much stress as the starting-point of the inflammation that finally leads to an obliteration of Fontana's space, Brailey looks upon as simply secondary to “the inflamed base and anterior surface of the iris.” Both Knies and Brailey found the choroid alone affected but in one or two cases. In one of Brailey's cases pathological alterations were found there only. It would then appear to be pretty thoroughly established that the choroid

is not the seat of the morbid processes causing an increase of intra-ocular tension, and the theories of Gräfe and Fuchs<sup>1</sup> are without any substantiation. Schnabel is very emphatic in his statement that in no case of glaucoma is there opacity of the vitreous. What has been mistaken for this is the infiltration of the cornea with the turbid fluid of which mention has been made. That the cornea and not the vitreous is the seat of the turbidity is proven by the fact that it is impossible to get the reflexes from the lens, which would not be the case if the vitreous were the seat of the opacity; and as mentioned in the paragraph quoted above, he looks upon a neurosis of the secretory nerves as the cause. Moreover, that this closure of Fontana's space is not the essential cause of the increased tension is shown by those instances where there has been undoubted increase of tension and the iris angle has been perfectly free (Brailey), and in those other cases where there has been a closure of Fontana's space and no increase of tension (Schnabel).

Nevertheless, the weight of evidence seems to be in favour of an important rôle played by Fontana's space in the process of exosmosis of the intra-ocular fluid, though we are hardly justified in considering its closure as the sole cause of the phenomena of glaucoma. Schnabel has shown that in only few iridectomies is the iris angle freed, even when the operation is successful in dissipating the glaucoma symptoms.

It would, however, be easy to see how in an eye "properly prepared" for an outburst of glaucoma, a closure of Fontana's space would quickly destroy the equilibrium between secretion and excretion, and bring on an "attack."

Further observations are yet needed, but we are apparently in the right road of investigation, and in a matter of this kind that is a cause for congratulation.

From Brailey's cases it is most probable that the iris too takes a part in the morbid processes leading to increased tension. In his group A, the iris was either solely or primarily affected. It is well known that iritis serosa is commonly attended with plus tension, but it is a question as to whether this is due altogether to the increased secretion. In these cases there is a dilatation of the pupil, and it is not impossible that the peripheral portion of the iris may be crowded into Fontana's space, or that the ciliary processes may be pushed forward, as contended for by Weber, to occupy the iris-angle. In either case it is possible that "filtration" would be hindered. Those sudden outbreaks of glaucoma after instillation of atropia can be explained in this manner. Though Pagenstecher has often found the ciliary processes pushed backward and inward, instead of forward, it by no means follows that if they were crowded into Fontana's space, the outflow of fluid would not be hindered.

Schnabel seems to be the only recent writer who attaches prime importance to deranged nervous action as a cause of increased tension. Others acknowledge that it may play a part, but look upon it as secondary, or as a complication. The importance of the "nervous" factor in glaucoma cannot be estimated from the pathological appearances shown under the microscope; for this we must look to the clinical history of the cases. The intense pain, the sudden appearance and disappearance of some of the symptoms in many cases would seem to point to an implication of the nervous system. As is well known, an attack of glaucoma may occur suddenly, and pass away in a few hours. This, it seems to us, can be

<sup>1</sup> Transactions Heidelberg Congress, 1878.

accounted for most rationally on the supposition of a deranged nervous action. It will hardly be denied by any one, I think, that the secretions of the eye are largely under the control of the nerves supplying it. There are few cases of neuralgia of the trigeminus in which there is not congestion of the conjunctival tissue and lachrymation. Many cases of "glaucoma outburst" are on record, after strong mental excitement. It is a fact, too, that women, whose nervous organization is in general more impressible than that of men, are most frequently subjects of glaucoma.

We think, then, that Schnabel has good grounds for his statement that "the regulation of the conditions of secretion and absorption, the compensation in cases of accidental disturbances belong to the domain of nervous action, and a disturbance of this action must be looked upon as the cause of the permanent increase of the vitreous humour in cases of glaucoma, and of the permanent diminution of this fluid in cases of detachment of the retina and essential phthisis." That the ciliary nerves have a controlling influence on the secretion of the eye-fluids, or at least on tension, is demonstrated in cyclitis, where there is, almost without exception, minus tension. That this minus tension is due to diminished secretion is rendered probable by the fact that we can most reasonably exclude an increase of excretion. From the amount of inflammatory matter thrown out, frequently in Fontana's space itself, we would, on the contrary, naturally suppose that filtration would be hindered. We have, however, diminished tension, and as it stands in immediate relation with "deranged nervous action" we can look upon them only as cause and effect.

It is an unfortunate fact, known but too well to operators, that an operation on one glaucomatous eye often brings on an attack in the other. It would be hard to exclude the influence of the nervous system in these cases. Possibly it may be the shock of the operation and the anxiety as to the results; but it is not at all improbable that the influence is exerted in a much more direct manner. In performing the iridectomy, section is made of the ciliary nerves in a region where impressions are most likely to be sympathetically felt in the fellow eye. Accepting, as I think the history of glaucoma cases will amply warrant us in doing, a predisposition on the part of the patient to a glaucomatous attack, we can readily see how easily an irritation of the ciliary nerves of one eye could be conveyed, by sympathy, to the other, causing a disorder in the secretion of the eye-fluids, manifesting itself by a plus tension.

That rigidity of the sclera, either senile or as the result of disease, is not the only true cause of glaucoma is proved by the fact that we have glaucoma in persons not old enough to have rigid sclera from age, and in whom a history of scleral disease is wanting.

Brailey's observations on the nerve excavation are of the utmost importance, since they are at variance with our accepted symptomatology and clinical history of glaucoma. We have always been taught to look upon the cupping of the disk as the pathognomonic sign of glaucoma, and since the normal tension of eyes varies so much, the condition of the nerve, in doubtful cases, has been looked to to give us indications for interference. In a disease where prompt action is so much demanded as in glaucoma, it is a matter of deep regret that one of our most trusted symptoms is likely to fail us.

Brailey has found, in his specimens, that the cupping of the disk "follows at some distance, in point of time, the increased tension, even where this has been considerable." He says that in one case, with a history of

five months' continuous pressure of  $+2$ , the disk was not undermined at its edges. And in many cases where a pressure of  $+1$  at excision had probably continued for seven or more years, the cup was neither deep nor undermined laterally. Schnabel accounts for the excavation by supposing some special alterations in its tissue. In fact the pathology of "cupped disk" is far from being clearly understood. In cases of glaucoma simplex, where the tension is so slightly increased as to be hardly perceptible, the excavation is frequently marked. Indeed it was a long time before Gräfe would agree to class his "amaurosis with excavation" under the head of glaucoma, and only did so finally under the supposition that more marked pressure had existed previously. That there is something in those cases which removes them from the category of the inflammatory form is rendered evident by the fact that iridectomy is not so certain in its curative effect. In many cases, indeed, vision fails very rapidly after the operation.

There is scarcely a limit to the length one might go in the discussion of these various theories respecting the different phenomena of glaucoma.

In glancing over the facts which section of enucleated eyes and the clinical history of cases have furnished, it seems to us clear that there is a quantity of truth in all the theories advanced. The trouble seems to be that each investigator has been looking for one single factor, when in reality there is no such thing.

It seems evident to us that if we would enter upon a study of the subject in a proper manner, and in one which would most surely lead to useful results, we must cease to regard glaucoma as a disease, and look upon it only as a *symptom*. Important practical results would, beyond doubt, flow from such a study of the subject. Gynecologists no longer treat dysmenorrhœa as an entity, but as congestive, obstructive, etc., recognizing any number of distinct causes as likely to lead to that condition. So it does not seem unreasonable to suppose that the ophthalmologist of the future will treat glaucoma with reference to its various causes, and that eserine or other narcotic, iridectomy or sclerotomy, will be the therapeutic means employed in accordance with the differential diagnosis.

This leads us to the consideration of treatment, which has shared next to pathology the attention of recent investigators on the glaucoma question. On this point we shall have to be briefer than we should like, since our paper has already grown to an unexpected length. The demands of science are never satisfied. When it was found that we had in iridectomy a means of curing a hitherto incurable disease, the ophthalmological world was rejoiced. But when it was found that it did not reach all cases, attention was directed to other means, which either theory or experience led operators to hope would be efficacious.

The only operation which shares with iridectomy the honour of curing glaucoma is sclerotomy. Sclerotomy was recommended as long ago as 1830 by Mackenzie, but Stellwag was the first one (1868) who in recent times employed it in a rational manner. Although Wecker, in 1869, contended quite strongly for sclerotomy, he appears latterly to have lost somewhat of confidence in it, for reasons which are not very clear. He says: "It is probable that during the rest of my professional career I shall continue to make by preference an excision of the iris as being the operation the most certain against glaucoma. I have, however, the conviction that as science progresses there will be substituted another procedure simpler and more logical."

Mauthner is in favour of abandoning the excision of the iris altogether,

and that, too, not on account of any theoretical reasons, but because experience has taught him it is not only unnecessary, but absolutely harmful. He says: "When I come forward as a defender of sclerotomy, my position is easily tenable, for in so doing I do not defend any theory. I understand the action of iridectomy just as little as that of sclerotomy. I know just as little of the cause of glaucoma as the foundation of its operative cure, and if any one were to recommend to me to-day any new operation as—*cum grano salis*—a cure for glaucoma, I should not doubt the *'possibility* of the affair."

One of the gravest charges he brings against the iridectomy is on optical grounds. The coloboma, he says, is the cause of such indistinctness of the retinal images as in many cases to bring the visual power of the eye *below* what it was before the operation. That it is due to the coloboma is shown by the fact that when the coloboma is covered V. rises. A second grave charge is that in some unexplained way the operation exerts an unfavourable influence on the disease of the nervous apparatus. I remember to have heard Wecker make the same statement verbally. He has seen so many cases of simple glaucoma get rapidly worse after the iridectomy, that he was forced to think the section of the iris exercised a pernicious influence on the nutrition of the nerve, and in such cases he always advised against iridectomy. What his results in such cases are with sclerotomy I do not know. Mauthner gives minute directions as to the manner he would have the sclerotomy performed; for these, however, we are forced to refer the reader to the original article. Schnabel, believing that the section of the iris acts in the same way as a neurotomy in neuralgia, of course looks upon the iridectomy as the important part of the operation.

Some two years ago Prof. Laqueur, of Strasburg, reasoning *a priori*, discovered the anti-glaucomatous effect of eserine, the active principle of the Calabar bean. Experience has fully demonstrated the efficacy of the remedy in certain cases, and so marked have been the results of its employment in some instances that a surgeon is hardly warranted in resorting to operative procedures without having first given eserine a trial. It would appear, however, from the knowledge thus far gained that it is most likely to be beneficial in acute glaucoma. In the chronic form we are not likely to derive much benefit from its use.

Weighing then as carefully as possible the facts as we have found them in respect to treatment, we are warranted, I repeat, in arriving at the conclusion that in—let us hope the near—future the treatment of glaucoma, will not be a mere routine mutilating of the iris, but that iridectomy, sclerotomy, or eserine, or other means not yet discovered, will be applied rationally and in accordance with a well-understood etiology of the affection.

S. M. B.

## ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XIX.—*Medico-Chirurgical Transactions*. Published by the Royal Medical and Chirurgical Society of London. Second series. Volume the Forty-third. 8vo. pp. lxxviii., 324. London: Longmans, Green, Reader, and Dyer, 1878.

As abstracts of many of the papers contained in this volume have already appeared either in previous numbers of this Journal or in the *Monthly Abstract of Medical Science*, which reaches most of our readers, we shall call attention in the present notice only to the remaining papers.

The first of these is a report of *A Case of Noma, in which moving bodies were observed in the blood during life*, and is contributed by Dr. ARTHUR ERNEST SANSOM. The examination of the blood in this case led to the discovery of organisms which Dr. Sansom believes have not been previously described. These organisms appeared under the microscope as highly refractile bodies, endowed with powers of rapid locomotion. On account of such motion their exact shape was difficult to determine; but when comparatively still, and a little out of focus, each one refracted light in such a manner that a small bright cross was visible in its substance. Thus they resembled crystals of oxalate of lime, with the exception that they were not perfect octahedra, but appeared as fragmentary crystalloids. The addition of a two per cent. solution of carbolic acid to the blood caused the movements of these bodies to cease, while that of dilute solutions of potash or sulphuric acid stimulated them. The latter effect was produced by heat, and they were found in the blood in the greatest number during periods of the most intense fever. Inoculation of the blood upon the lower animals produced septicæmia, with the manifestation of similar motile particles. They were also found in the urine. On the other hand, inoculation of the fluids derived from the diseased tissue, induced only peritonitis, without discoverable alteration of the blood.

Mr. MORRANT BAKER reports a case of *Removal by Operation of a Large Hairy Mole occupying half of the Forehead*, occurring in a healthy and well-developed girl of ten years of age. The integument composing it was deeply pigmented, being of a dark, blackish-brown tint, with a very uneven surface, especially below and to the left, where it was mammillated or almost warty. A quantity of coarse hairs grew from nearly every part of the surface, being thickly planted, as in the case of the hairy scalp, and many of them an inch or two in length. The operator thus describes his method of procedure:—

“I began the treatment,” he says, “after the patient was put under the influence of chloroform, by cutting off a small portion of the surface of the mole as smoothly as possible with a sharp scalpel; taking care, while cutting away both the epidermis and corium, not to remove the whole thickness of the latter, in order that the subcutaneous tissue might be left untouched, and thus such contraction as is apt to follow its destruction might be prevented. Free but not excessive bleeding occurred from every part of the cut surface. It was controlled easily by a pad and bandage. Two days afterwards the dressing was removed, and the surface allowed to form a scab, which was not touched for several days.”



The remainder of the mole was removed about a month later, and the wound left to heal by itself under a scab in precisely the same way as before. In less than a month after the second operation the wound was almost completely healed. The scar was smooth and not pigmented, but hairs had begun to crop up again pretty freely from its surface. As it was evident that the skin must be destroyed to a greater depth in order to get rid of the larger hair follicles, Mr. Baker applied nitric acid to the surface in the hope that the liquid caustic might find its way into the hair follicles, and thus affect, to a slightly deeper level than the general surface of the integument, those structures which he desired to attack. After several applications of the acid the mole had almost entirely disappeared, the only traces of its presence being a tiny patch here and there of deeply pigmented skin, with a very few fine hairs, almost imperceptible except on close inspection, growing from it. In conclusion he says:—

“The scar tissue is now smooth, whitish, glazed, and supple; quite level with the adjoining healthy integument, and not in the least degree contracted, or dragging in the least on neighbouring parts.”

In a report of *The Microscopic Anatomy of the Smooth Tongue* (Chronic Superficial Glossitis), Mr. HENRY TRENTHAM BUTLIN points out the fact that the disease presents many points of resemblance both to psoriasis and to ichthyosis of the tongue. Expressed shortly, the changes which he observed consisted in thinning of the epidermis, with destruction of the papillæ and other appendages; in thickening and increased vascularity of the corium, and infiltration of its superficial layers with nuclei or cells. The disease producing these changes appears to be a chronic inflammation of the mucous membrane, which has gradually produced complete alteration in the characters of the epidermis and thickening of the corium and submucous tissue. The surface of the tongue is not reduced to the condition of mere “cicatricial tissue,” as described by Mr. Fairlie Clarke, for some of the chief characteristics of this tissue are absent.

Dr. WILLIAM M. ORD proposes to apply the term *Myxœdema* to the cretinoid affection originally described by Sir William Gull, in the *Transactions of the Clinical Society of London*, vol. vii.<sup>1</sup> In a case which terminated fatally he found the œdematous condition of the skin to depend upon an enormous increase of the “normal mucin-yielding inter-fibrillar cement,” and not upon the presence of serum, as he had at first supposed. When subjected to chemical examination portions of skin derived from his patient’s body yielded fifty times as much mucin as could be extracted from similar portions of skin taken from other bodies, whether œdematous or not. The apparent œdema of the cretinoid affection is unaffected by pressure or change of attitude, and is well marked in the face; more so at first than in the lower extremities. The skin retains its œdematous condition even when cut up into small fragments; whereas the skin of dropsical patients collapses when so treated. In addition to this appearance of the skin, the arteries were everywhere thickened, the larger were atheromatous, and there was firm, almost solid œdema in many parts—*e. g.*, in heart, soft palate, larynx, stomach, and neck of bladder. The brain, also, showed very considerable degeneration of the large arteries. In the coats of the arteries the adventitia was often swollen to three or four times its proper proportions, with the fibrils well defined, as though separated from each other by a swollen interstitial substance. In the kidneys a similar thickening, growing inwards from the capsules of the Malpighian bodies, could be seen encroaching in various degrees up to obliteration upon the contained glomeruli of capillaries; and in the liver an enormously disproportionately swollen connective tissue separated the cells from one another,

<sup>1</sup> See number of this Journal for July, 1875.

and evidently encroached on them, and tended to produce atrophy in them. In the thyroid gland the alveoli were compressed and mostly annihilated by a growth of the same kind; and in the muscular tissues, particularly in the heart, the same sort of excess of cement was clearly recognized.

Dr. Ord is of opinion that the symptoms of the so-called cretinoid state can be explained by regarding them "as effects of this jelly-like swelling of the connective tissue, chiefly if not entirely consisting in an overgrowth of the mucus yielding cement by which the fibres of the white element are held together." Accordingly he proposes to call it myxœdema.

In regard to the way in which he thinks the symptoms are produced we will let him speak for himself.

"I would argue," he says, "that the most important mode of operation by which this condition produces the symptoms associated with it is the padding of the peripheric termination of the sensory nerves, and perhaps, too, of the muscular nerves, with a soft material which hinders their free reception of impressions. That perception becoming slower than usual, and the central nervous system losing through the altered state of the skin its natural and necessary stimulation, a state of intellectual lethargy and slowness in coördination of movements are necessary consequences. In this chain slow use, partial disuse, and numbness of faculties are links of one kind, and the constant retardation of guiding sensory impulses a link of another; so that supposing the myxœdema to be constant the nervous degradation tends to be progressive. The train of symptoms leading to the fatal termination commences in the encroachments of the myxosis upon vessels and upon the secreting elements of glandular structures."

Just before the close of the two fatal cases the author reports in his paper, albuminuria was added to the other symptoms, showing the extension of the disease to the kidneys.

In his paper *On the Proportion of Red Corpuscles in the Blood, in some skin diseases*, Dr. GEORGE THIN arrives at results which we were scarcely prepared for. The only cases of skin disease in which he found the corpuscular element of the blood deficient were a case of pemphigus and one of prurigo. On the other hand the number of corpuscles was normal in the cases of psoriasis, eezema, and leprosy, which he examined. The table appended to the paper shows the number of red blood-corpuscles per millimetre cube in seventeen cases of various forms of skin disease.

A second paper, by Dr. THIN, is *On the Condition of the Skin in Tinea Tonsurans*, in which he takes ground with Küchenmeister, as against Kaposi, that the parasite in this disease is only found among lifeless epidemic products, and does not exist amongst those which still retain even the smallest degree of organic life. In order thoroughly to study the condition of the skin, sections obtained from a mare affected with the disease were examined microscopically, and with the following results:—

"The spores of the trichophyton tonsurans are found," he says, "in and immediately surrounding the hair shaft, and plentifully between the latter and the internal root sheath. In this position they travel downwards from the free surface of the skin, along the hair shaft, to a considerable depth; but in no instance did I, in my sections, find them reach to the hair papilla. They travel deeper than the level of the sebaceous glands. Not only do they not extend laterally to the external root sheath, but they do not penetrate the internal root sheath, and they are never found in the substance or openings of the sebaceous glands. On the surface of the skin they are only found amongst the most superficial scales of the epidermis. The parts of the hair with which the spores are found in contact are thus analagous to the superficial epidermic scales of the horny layer of the epidermis."

In regard to treatment the author says, that next to carefully-performed epila-

tion the best treatment is to use an application that will keep up a slight degree of congestion of the affected skin over a considerable period. This gives rise to a persistent effusion of serum, which penetrates the hair sheaths, and bathes unceasingly the spores that surround and infiltrate the hairs, and which finally acts destructively on the fungus. Between the vegetable parasite and the living fluids of the body there is no *modus vivendi*.

In a *Second Communication on Simple Atrophic Sclerema*, Dr. JOHN HARLEY completes the history of the case of this disease which he reported in the previous volume of these Transactions. The patient died in consequence of an attack of diarrhœa. At the autopsy the sclerema and stiffness of the wrists and finger-joints had completely passed away, and there was no extraordinary lividity of the now soft and emaciated fingers. There was no trace of œdema anywhere, the skin was thin and supple, and almost every trace of fat had disappeared. The liver, kidneys, suprarenal bodies, spleen, mesenteric glands, pancreas, and the alimentary canal were all healthy. There were pericardial adhesions and some dilatation of the right ventricle. Excepting the diaphragmatic surfaces, the lungs were everywhere adherent, and so firmly adherent that only a portion of the antero-lateral surface of the right could be separated without laceration. The author seems to regard this condition of the pleural membranes as the cause of the sclerema, for he says: "That it is an interesting fact that the condition above described as simple atrophic sclerema may be one of the results of general pleurisy." He does not, however, attempt to explain the connection which he believes exists between these two morbid states.

Dr. LAIDLAW PURVES is the author of a report on *One Hundred Cases of Paracentesis of the Tympanic Membrane*, which contains remarks on the methods of operations and the results obtained therefrom. The method which he prefers to all others is Voltolini's with the galvano-cautery. The following is the procedure which he recommends:—

"Having," he says, "ascertained by perosseal audition, that the acoustic is fairly healthy, the hearing power is determined by the watch. A preliminary puncture is then made by means of a broad needle, and while the opening gapes and is still unaffected by the congestion arising from the irritation, the hearing power is again ascertained. If it has improved, the galvano-cautery, if ready, may be at once applied to the spot, and the opening made as desired. . . . The opening having been made by the cautery, a pad of wadding smeared with mercurial or simple ointment, or the glycerine extract of pancreatine, is pressed against the drum, so as to expand it as much as possible, and left there for two days. The wadding is removed every second day, the parts washed with warm water and carbolic acid solution, the drum drawn outwards by means of the vacuum speculum, for the purpose of preventing any adhesions forming, and the wadding again applied."

The general results are stated as follows: Of 8 cases in which paracentesis was performed on account of tinnitus, 2 were benefited, 5 were not improved, and in 1 the result is not given; of 6 cases of nervous deafness, not one was improved; of 39 cases of cataractous drums, 23 were benefited, 12 were not, 3 were doubtfully improved, and in 1 the result is not given; of 7 cases of relaxed membranes, paracentesis improved 5, the remaining 2 were not improved. In 21 cases in which the perforation was made for the removal of fluids or solids from the cavity, 15 were benefited, 5 were not, and in 1 the result is not given. In some cases, especially among those of cataractous drums, the benefit derived from the operation was so great that it was repeated several times at the request of the patient. The cases are arranged in tabular form for convenience of study.

In the course of his article *On Some Points in the Minute Anatomy of the Kidney*, Dr. REGINALD SOUTHEY refers to Henle's discovery of the "down

looping" tubes in the bundles of straight tubes which compose the substance of the medullary rays of the kidneys, and attaches some importance to them in relation to the pathological phenomenon of tubular casts. They are much smaller in calibre than either the straight tubes of the cones, or the tortuous tubes of the cortex. "If," he says, "casts or plugs collect in the tortuous tubes, their passage onwards and outwards must be slow and laborious, and to be effected only through some gradual dilatation of the narrow looping passages. Further, such casts, by distending the down looping tubes upon their passage outwards, must seriously disturb or obstruct the circulation through the vasa recta."

It is only fragmentary débris and fatty globules, which, in his opinion, travel down from the tortuous into the excretory tubes; and even in advanced renal disease, it is remarkable how free from plugging and degeneration these down-loopers usually remain, a circumstance which could scarcely happen if much solid material ever passed through them. All casts found in the urine, he therefore thinks, derive their form from the excretory system of urine tubes. The chemistry of their substance may be vaguely described as "some colloid." Two qualities of colloid may, however, for clinical purposes, be distinguished, the one derived from the upper glandular portions of the renal tubes, an abnormal secretion from its glandular cells, giving a yellow, waxy look, and highly refracting features to the cylinders formed of it, the other a fibrino- or albumino-plastic colloid, essentially whiter and more transparent than the former, derived from the setting of blood plasma which has transuded into the tubuli from the bloodvessels at a lower part of their course. The author does not pretend to be able to state that a particular cell-form seen in a cast has been derived from a tortuous or an excretory tube; the only cell-forms which he recognizes being leucocytes, white or red blood-cells.

Mr. HUTCHINSON communicates some observations *On Paralysis of the Internal Muscles of the Eye*, which is accompanied by symptoms which indicate, in his opinion, disease of the lenticular ganglion. The symptoms which we would expect from destruction of the lenticular ganglion, receiving, as it does, branches from the third, the fifth, and the vaso-motor nerve, are iridoplegia or paralysis of the iris, both as to its circular and radiating fibres, and cyclo-plegia or paralysis of the ciliary muscle. The author holds that when this triad of symptoms is present without any other form of orbital paralysis, the seat of the disease can be in no other structure than the ganglion itself. If, however, any of the recti muscles are affected also, the disease must be seated further back—either in the trunk of the third or sixth nerve; and if only one or two of the separate symptoms forming the triple group were present, the inference would be ready that the disease might be seated either in front of the ganglion, or behind it in the trunk of the nerve involved.

Mr. Hutchinson reports 7 cases, to show that this precise group of symptoms, to which he proposes to give the name *Ophthalmoplegia Interna*, is occasionally met with. In 4 of these cases there was a distinct history of syphilis, which he regards as tolerably conclusive evidence that it is possible for syphilis to attack and disorganize the separate ganglia connected with the vaso-motor system.

A tabular statement of 8 cases, which have come under the author's observation, is appended to the paper.

Dr. REGINALD E. THOMPSON gives the result of his observations *On the Pathological Traces of Pulmonary Hemorrhage*, in an interesting paper, in which he refers to the surprising fact that notwithstanding the frequency of hæmoptysis, there is a remarkable paucity of pathological proof of its effects upon the lungs, the question having been studied almost exclusively from its clinical aspect. If the lungs be examined shortly after a hemorrhage, numerous round, well defined,

and circumscribed nodules are found, differing in these respects from pneumonic products, which are, the author says, of irregular shape, and generally shade off into the tissue near. The tissue in the surrounding region shows marked evidence of irritation, the result being similar to that which obtains in the irritation of pulmonary catarrh, with general thickening and increase of the connective tissue elements. On examining the section with a lens, small elevated nodules may be found, which, on further examination, prove to be solitary alveoli or bronchioles, plugged with blood-globules firmly packed into the lumina, and in some cases distending them. The nodules themselves show a strong tendency to drag away from the surrounding tissue, and either undergo a gradual process of erosion, or a general liquefaction, which involves the whole mass equally. In either case, however, the hemorrhage may result in excavation of the lungs, or, in other words, give rise to a phthisis ab hæmoptoe. With regard to the possibility of an infection of secondary tubercle following upon this hemorrhagic condition, the author expresses himself as follows:—

“If simply the presence of secondary tubercle is looked for, it might be admitted that it may occur as an ultimate result of such disease, but if the question be asked in this form, namely, whether the secondary tubercle arises simply from the blood products, then the answer must be, that up to this time no case has presented itself in which the blood product has not undergone a secondary process, and that it requires more evidence to determine this point in a satisfactory manner.”

The author has also found, as an occasional result of capillary hemorrhage with laceration of the pulmonary tissue, calcareous masses, sometimes of considerable size.

In his *Notes on the Spirillum Fever of Bombay, 1877*, Dr. H. VANDYKE CARTER, of H. I. M. Indian Army, takes the ground that the fever is really identical with relapsing fever, and he certainly succeeds in showing that there are many points of similarity between the two diseases. The rate of mortality in the former, ten per cent., is much higher, however, than that of ordinary epidemics of the latter, which Dr. Murchison gives as 4.75 per cent. The author lays great stress upon the occurrence in the blood, in both diseases, of a peculiar organism, the spirillum, or, more properly, spirochaete. This parasite is not found, he says, in any form of malarial fever, typhoid, or, in fact, in any other disease except relapsing fever. He describes it as—

“A colourless, homogeneous, and very delicate spirally-twisted filament, which during life is in constant motion amidst the *liquor sanguinis*. The spiral or corkscrew twist is regular, and best seen when the organism is quiescent, or after its death; whilst during active movement it becomes undone, and may almost disappear, the filament meantime gaining in apparent length.”

J. H. H.

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ART. XX.—*Saint Bartholomew's Hospital Reports*. Vol. XIV. London: Smith, Elder & Co., 1878.

VOLUME XIV. of these well-known reports, though larger than many of its predecessors, hardly sustains the reputation for originality and thoroughness which has hitherto so generally characterized its contributions.

It opens with an able statistical article by REGINALD SOUTHEY, M.D., entitled *Observations on Acute Rheumatism*; a paper which brings us back to the ideal contribution to a “Hospital Report.” It contains a great many points of

interest and importance, only a few of which, however, we will be able to notice.

First, alluding to the season of greatest prevalence of acute rheumatism, we are prepared to find the greatest number of cases occurring in the winter months, though if we attributed at all the occurrence of acute rheumatism to cold and dampness, we would hardly expect to find the next greater number of cases occurring in the summer months; (spring 15, summer 33, autumn 24, winter 39), a condition opposed to the statistics collected by all other authorities (Senator). Though, as Dr. Southey candidly allows, his figures are hardly yet extensive enough to permit of definite conclusions on this point.

The relative mortality at different ages is then considered, the author placing, in 4908 cases, the mortality below 10 years of age at 3.40 per cent.; between 10 and 15 years at 1.5 per cent.; between 15 and 25 at 1.4 per cent.; between 25 and 35 at .9 per cent.; between 35 and 45 at .8 per cent.; while above 45 it stands at .4 per cent.; thus showing a gradual decrease in fatality from infancy to old age. In 3552 cases of acute rheumatism, cardiac complications occurred in 29.8 per cent.

Acute rheumatism the author describes as divisible into two forms: the acute continued and the acute relapsing; both are diseases of youth and early manhood, rather than childhood, middle or old age. The acute continued form usually attacks the muscular and robust; there is seldom any remission of pain or fever, except from the action of sedatives, before the eighth or ninth day; the temperature pretty steadily remains at  $101.5^{\circ}$ – $102^{\circ}$  (barring pericarditis). The inflammation suddenly subsides and defervescence gradually occurs, the patient being able to be about on the twenty-first day, though there is no tendency to a fixed crisis. This form is more apt to be complicated by pericarditis and pneumonia.

The subjects of the relapsing form are apt to be weak and anæmic. A striking peculiarity is that when once in bed, their pains diminish, and the disease seems rapidly to subside under every treatment, the temperature being usually reduced to normal by the seventh day. Usually again on the third day the inflammation and fever return, and may last a week, defervescence usually being complete by the fourteenth day. This may again be succeeded by a second, third, or fourth relapse, each relapse tending to be more severe than the original attack, while few of the cases which have had two attacks fail to present cardiac murmurs and permanent valvular lesions; endocarditis being the most frequent complication in this form. As regards the diagnosis of these forms at the outset, Dr. Southey states that the involvement of three or more joints simultaneously and the shifting of the local pain and inflammation rapidly is apt to indicate the acute continued form; while the relapsing form at the outset is apt to present inflammation of fewer joints, with less reddening of the surface and tenderness on handling, while the swelling is really more within than outside the joints.

The author next sought for the influence of the type of invasion, whether sudden or gradual, on the severity of the disease, and now again he has not felt in a position to speak with positiveness.

His conclusions are, however, that cases of acute invasion are more numerous; that pericarditis is more apt to occur in a case which began suddenly, but cases of retarded invasion are not necessarily exempt, while proportionately more relapses and certainly more serious relapses and more endocarditis are attached to cases which commence gradually and insidiously. Then again, "A highest temperature attained upon the 8th day of the disease usually indicates the acute continued form of rheumatic fever with its ordinary attendant pericarditis; and if the temperature falls gradually upon the 9th, 10th, and 11th day by gradual defervescence, the convalescence may generally be predicted to be complete and continuous."

"If remission to a normal temperature takes place on the 7th day, the probability of a relapse is considerable; if on the 12th day, recovery is uniform; if on the 14th day, about a third of the cases have a relapse." Then as to the probability of relapse inferred from the mode of defervescence, we find that in proportion to the rapidity of the defervescence is the tendency to relapse. Proportionately, more cases relapse in winter than in other seasons. These modifications of the course of the disease are claimed to be little modified by treatment, a statement apparently warranted by the fact of their deduction from cases subjected to such diverging lines of treatment as instanced in Table XI. Large doses of quinia given in the intermission, he states that he has recently noticed, seem "to obviate relapses or to reduce their length and severity in no small degree," while salicylate of soda in full doses lowers the pulse, reduces the temperature, and relieves the articular pains.

Following this paper is a rather unsatisfactory report of twenty-five cases of *Cervical Opisthotonos of Infants*, by Drs. GEE and BARLOW. The distinction of this from other forms of meningitis appears to be based on the fact that retraction of the head existed in every case, though the histories of the cases in nearly all instances are the merest outlines, and post-mortem examination was made in only five cases, and then very imperfectly.

The next article is by Dr. J. WICKHAM LEGG, on *Varieties of Icterus Gravis*, particular stress being laid upon the points of striking similarity in the symptoms and morbid anatomy of idiopathic icterus gravis, and the conditions caused by various poisons, more particularly by phosphorus.

Dr. CHARLES JEWEL EVANS, in the following contribution, furnishes a *Report of over Four Hundred Cases of Scarlatina*, which occurred in his practice during five years. Several points of interest are illustrated in his paper, among which may be mentioned the confirmation of the usually accepted observation that dropsy is more apt to complicate the mild cases, and also several cases in which the dropsy preceded the appearance of the rash. He also mentions rheumatism as complicating the convalescence of a considerable number of cases.

Dr. J. MATTHEWS DUNCAN reports a case of *Fibrous Tumour of the Uterus, Complicated with Inversion*, in which the tumour was removed by enucleation, and reduction of the inverted uterus accomplished, after three failures, three months after the removal by pressure kept up on the fundus for seventy-two hours; the reducing agent being a straight stemmed repositor, the cupped end being applied to the fundus, and constant pressure secured by attaching the other end by India-rubber straps to the horizontal limbs of an ordinary T bandage. The reduction of the uterus was marked by severe pain, sickness, and numbness and pain in left leg. Three weeks afterwards she left the hospital feeling in good spirits, though suffering from pain in the back, with occasional attacks of sickness. Three weeks after leaving the hospital her death was reported, her previous symptoms having been anorexia and constant vomiting, œdema of both feet and left leg, rigors and fluctuation of abdomen. Dr. Duncan states that "there appears to be good reason to believe that the death was the termination of the morbid conditions, a part of whose history is given in this report. Probably extreme anæmia was the chief element in the causation of the fatal event."

Under the title of *Cases from the Throat Department*, Dr. F. DE HAVILAND HALL has reported nine cases, some of which are interesting; among which may be mentioned the development of a small sessile growth on the arytenoid commissure during specific treatment. It is then some months later reported to have disappeared, but it does not appear as to whether it was destroyed by local applications, removed, or disappeared under general treatment. There is also a report of a case of apparent tracheal stenosis, to which no cause could be assigned,

though thoracic aneurism was carefully looked for. No mention is made as to the possibility of enlarged tracheal or mediastinal glands.

The next article is a *Report of Forty Cases of Rheumatic Fever*, by SAMUEL WEST, M.D., in which, among other points, he places the percentage of cardiac complications in first attacks at 50 per cent., and at 66 per cent. of subsequent attacks; a percentage so much above that ordinarily observed that we think the discrepancy must be attributed in this instance to the small number of cases observed (16 first attacks, 21 subsequent attacks). He also calls attention to acute dilatation of the right ventricle occurring in the course of acute rheumatism, an occurrence which he attributes to organic change in the muscular tissue.

Following this report there is an account, by the same author, of an interesting case of *Paraplegia with Sacral Decubitus* (which latter term seems rather a senseless affectation), whose pathology, as discovered by autopsy, is described as follows: "In a patient with chronic inflammation of the lungs and bronchiectasis, one of the dilated bronchi lay so close to the surface as to lead to a considerable thickening of the pleura over it. Through these adhesions the inflammation propagated itself to the ribs, where it set up caries, and led to the formation of an abscess. From this abscess the pus travelled along the course of the nerves towards the spinal column, entered the spinal canal through the intestinal foramina, and led to suppurative inflammation of the post-meningeal tissue. An abscess formed here which produced by pressure acute softening of the spinal cord a short distance lower down," which latter lesion was associated with trophic disturbance, *i. e.*, a bed-sore, and ulcers in the bladder and urethra.

As a simple method of determining in an autopsy the *competency of the mitral and tricuspid valves*, Dr. LAUDER BRUNTON recommends the passage of the nozzle of an ordinary enema syringe, one with a shield at about half an inch from one end being preferred, through the auriculo-ventricular opening, and then forcing it through the walls of the ventricle until it projects at the apex. It is then pulled nearly through, and kept in position by a strong rubber ring. The competency of the valves can then be determined by injecting water through the nozzle into the ventricles, escape through the aorta and pulmonary artery being prevented by compression.

We should think that a simpler method would be to insert the nozzle into the ventricles through the aortic or pulmonary opening after the efficiency of those valves had been determined, the escape being prevented by compressing the arterial walls around the nozzle.

Some observations on the *Action of Pilocarpine* are recorded by W. E. STEAVENSON. He states that he employed hypodermic injections of one-sixth of pilocarpine, daily, in three cases of Bright's disease, one being acute nephritis after scarlet fever, and did not observe the slightest benefit following its use in any case; in no case did the quantity of albumen diminish, but actually increased. The first few injections caused profuse perspiration, which diminished as the injections were repeated.

*A Case of Intra-Thoracic Tumour* is reported by Dr. W. S. CHURCH, and *Cases of Disease of the Spinal Cord*, by J. A. ORMEROD, M.D., which we regret our space will not permit us to notice.

There is also a paper by Dr. V. D. HARRIS, on the *Diagnosis and Treatment of Apparent Drunkenness*. R. M. S.

Of the surgical papers in the volume, the first is a short article on *Indurations of the Breast becoming Cancerous*, by Sir JAMES PAGET, in which he states that the signs to be most relied upon in deciding that mammary indurations are not likely to become cancerous are, first, that there is less hardness, and a sensa-



tion of toughness rather than of hardness in the non-malignant indurations; secondly, that they are also less rounded, less nodular, less well defined, more apt to be multiple than cancerous masses, and do not invade, infiltrate, or pucker the skin overlying them. He lays great stress upon this last point, and believes that when the nipple or any part of the skin of the breast is drawn into a subjacent hardness, it is almost certainly cancerous. In the treatment of mere indurations he recommends liquor potassæ in drachm doses, alone or combined with iodide of potassium. If this treatment is ineffectual, removal is to be undertaken, especially if there be doubt in the diagnosis, or reason to fear that the nodule may become cancerous.

A paper on *Compound Fractures of the Lower Jaw* is only worthy of mention because of an illustration showing the application of Hammond's interdental wire splint.

The best surgical articles in the book are: *Complete Intra-peritoneal Ligature of the Pedicle in Ovariectomy*, by ALBAN DORAN; *Seven Years of Hospital Practice*, by Mr. CALLENDER; *Commencing Cataract; its Symptoms and Treatment*, by Mr. VERNON; and *Note on the Treatment of Angular Disease of the Spine by Sayre's Plaster of Paris Jacket*, by Mr. WILLETT.

The first mentioned is a continuation of a similar article in last year's report, and presents the post-mortem appearances found after intra-peritoneal ligature and closure of the abdominal wound, in ten cases that died after being operated on by various surgeons in the Samaritan Hospital. He summarizes about as follows: In the series but a small minority were cases of death evidently due to complete intra-peritoneal ligature, and in all of the cases old standing disease of the thoracic or abdominal viscera was found. The presence of a cap of firm coagulum upon the end of the pedicle is favourable, because it indicates that the ligatures have not been tied so firmly as to cause sloughing, yet have been drawn tightly enough to prevent dangerous hæmorrhage. The pedicle may partially slough in cases where there is fair reason to suppose that the unfavourable change is due to the ligature being pulled so tightly as to cause sloughing, before certain well-known salutary changes can save the stump of the pedicle. Hence, it follows that it is much more dangerous to draw the ligatures a little too firmly than to leave them somewhat looser than is strictly advisable. He considers the intra-peritoneal ligature preferable to the clamp, because there is no dragging of the uterus up towards the abdominal wound; and he thinks these post-mortem notes show that the fatal result was seldom, if ever, due to the method of securing the pedicle.

Mr. Callender in his paper states that there has not been a surgical case of pyæmia in his wards during the last five years; he attributes this immunity to the careful treatment of wounds, to cleanliness, and above all to thorough drainage. It must be remembered in this connection that Mr. Callender does not use the antiseptic spray and gauze in the treatment of his cases, but employs lint saturated with carbolized oil, which is laid upon the wound after the latter has been thoroughly cleansed with carbolized water. The inner layer of lint is re-oiled when necessary, but allowed to remain as long as possible without removal. An interesting portion of his article discusses the question of the asymmetry of normal lower extremities, and gives a table of the twenty-five patients whom he measured; he found in almost every instance the legs of equal length. His results differ from those obtained by observers who have studied the subject in the United States, in which the occurrence of differences in length has been the rule rather than the exception. Besides the results obtained clinically, the measurements of the osseous skeleton made by Roberts (*American Journ. Med. Sciences*, Oct. 1878), and by Thomas Dwight (*Ibid.*, Jan. 1879, p. 202), go to show the fact

that asymmetry occurs at least frequently enough to render accurate measurements for the determination of shortening after injuries an impossibility.

Mr. Vernon's article on commencing cataract is timely and worthy of perusal, especially by general medical practitioners for whom it seems to have been written, because of the many cases of chronic glaucoma which are mistaken for incipient cataract. Would that every student sent from the medical schools of Great Britain and America knew this one fact in ophthalmology, that neuralgic pain and impairment of vision, associated with increased hardness of the globe, mean total blindness, and that iridectomy is the only hope for the patient. Thanks are due to Mr. Vernon for laying the subject before the students of St. Bartholomew's, in a paper free from those technicalities understood by but few.

While discussing this subject we shall notice the paper on *Wounds of the Ciliary Region, and their Treatment with Eserine*, by Mr. W. BRUCE CLARKE. He gives tabular statements of the cases treated before and since the employment of eserine, with apparently better results in the latter class of cases; but the small number of patients treated is not sufficient to prove the point. Moreover, sulphate of eserine (derived from Calabar bean) has been introduced so recently for the purpose of diminishing intra-ocular tension, and preventing prolapse of the iris through wounds of the eyeball, that we must wait for further experiments before accepting the results as proved.

Mr. Willett discusses the treatment of angular disease of the spine by Sayre's plaster of Paris jacket, and desires to express unhesitatingly the satisfaction he has experienced in its use. There is appended a table of 60 cases so treated during the first nine months of 1878; these are all instances of dorsal or lumbar caries, for he prefers to treat caries of the cervical vertebræ otherwise than by suspension, and the fitting on of a jury mast. An important observation is that there is a liability to syncope, and even occasionally to vomiting, during the suspension. He states that one in every four adults faints during the application of the plaster jacket, and that this occurs especially in women. In a short article following the one now under discussion, he records *A Case of Fatal Vomiting following the Application of Sayre's Plaster of Paris Jacket for Kyphosis*. Nausea occurred during suspension, and constant vomiting began some time after the patient left the hospital. The plaster bandage was removed, but the patient died in a few days. The autopsy revealed simple but great dilatation of the stomach, which was unsuspected. Mr. Willett is experimenting with the plaster jacket applied while the patient is suspended in the horizontal position with the face downwards. There has been in these cases no syncope or vomiting. In a few instances, where the patients were attacked by bronchitis while wearing the jacket, it became necessary to remove the dressing because of the urgent dyspnoea. The length of the time required for cure he is inclined to believe is rather longer than four to six months, as given by Sayre. He has moreover been unable to find, by taking the outline of the spinous processes before treatment and when cure has been affected, that there has been any straightening of the vertebral column. In the majority of cases a perceptible increase in the curvature has been apparent.

A rare and interesting case of *Multiple Sarcomata* is reported by Mr. HOLDEN, who merely gives the history and post-mortem record.

*Antiseptic Surgery* receives the praises of Mr. THOMAS SMITH, who relates his experience with the method of Lister during three years of hospital practice.

From Mr. MARSH we have a paper on *Manipulation in Surgical Treatment*, which, with the exception of some cases, tells but little that is not to be found in Wharton Hood's book "On Bonesetting," which should be read, by the way, by every surgeon.

The article on *Compression versus Inflammation*, by Mr. KEETLEY, gives some good points in the use of this means of combating the inflammatory process.

In the appendix an analysis of the *use of anæsthetics* in the hospital is given, which states that during 1877 chloroform was administered 699 times, ether alone 23 times, ether preceded by nitrous oxide 1123 times, and nitrous oxide and bichloride of methylene in a few instances. This is of importance, as showing how the safer anæsthetic, ether, is gaining the ascendancy over treacherous chloroform even among English surgeons.

As the result of the examination of this volume representing the daily work of one of London's oldest hospitals, the reader will notice a characteristic which all such works are apt to have in common, namely, a considerable amount of padding. A few papers stand out prominently, showing the result of accurate scientific study, while others are interposed, apparently, for the purpose of covering so many pages, and of giving the volume the requisite bulk. J. B. R.

ART. XXI.—*Diphtheria: its Nature and Treatment, Varieties and Local Expressions*. By MORELL MACKENZIE, M.D. Lond., Senior Physician to the Hospital for Diseases of the Throat and Chest: Consulting physician to the Northeastern Hospital for Children; and Lecturer on Diseases of the Throat at the London Medical College. 12mo. pp. 104. Philadelphia: Lindsay & Blakiston, 1879.

THIS little work exhibits the accuracy, care, fulness of research, and facility of condensation which have been displayed by its author in his previous essays on throat diseases. Its contents are divided into eleven chapters, entitled, successively, definition and history, etiology, symptoms, paralyses, diagnosis, pathology, prognosis, treatment, laryngo-tracheal diphtheria, nasal diphtheria, and secondary diphtheria, preceded by a brief preface, and followed by a full index.

The development of opinion concerning diphtheria during a period of nearly twenty years since any English work upon the subject has appeared, led the author to believe that a short sketch, from one who has had considerable opportunities of studying it, would be of interest and use to the profession. Allusion is made in the preface to diphtheria as the cause of the deaths of George Washington and the Empress Josephine; but these deaths have been generally attributed to œdema of the larynx in acute laryngitis.

The definition of diphtheria, consuming nearly twenty-one lines, is in reality, rather a concise summary of the general character, manifestations, symptoms, and progress of the disease. Its language, in the outset, indicates the author's disbelief in the spontaneous origin of diphtheria; for, instead of describing the disease as sometimes occurring *sporadically*, he introduces a new epithet, *solitarily*, to which attention is directed in a foot-note, and further on, in the chapter on etiology, the opinion is expressed that "those cases which appear to originate *de novo* probably always arise from the virus, often long dormant and forgotten, of previous cases." The argument for this opinion is discussed at full length, drawn from the researches of Simon and other writers on sanitary topics in this connection, as well as from individual observations, including those of the author, who mentions that in one instance he has known the poison to remain dormant for three years, and then again to become active.

In discussing the history of diphtheria, the evidence of researches is carried farther back than in any previous history that we can recall. Its probable recogni-

tion is traced to the Sanskrit *System of Medicine*, by D'havantare, "at a time nearly coeval with that of Pythagoras," and to the epidemic Askara of the Talmud, as well as to other authorities more familiar to the medical antiquarian. A very full and succinct historical record follows for eight pages, with numerous references; a little mine of bibliographic metal for future explorers. The observations of our own Bard (unwittingly accredited to Philadelphia instead of New York, being quoted from Trans. American Philosophical Society, Philadelphia, 1789, and not from his *Researches*, etc., on Sore Throat, N. Y. 1771) receive due acknowledgment for their accuracy.

With regard to the nature of diphtheria, the judicious statement is made that observations are not sufficiently conclusive to warrant a conclusion as to the essence of the disease; and it is intimated that the "germ theory" explains all the phenomena of the specific fevers. The remarks on climatic and atmospheric conditions favourable to the contagion, its mode of diffusion, and the like, hardly call for special comment other than that they faithfully represent the most approved current professional opinions, save, perhaps, that one attack probably affords a very slight protection against recurrence.

In describing symptoms, the disease is classified into several constitutional forms: (1) *typical*, (2) *mild or catarrhal*, (3) *inflammatory*, (4) *malignant*, (5) *gangrenous*, and (6) *chronic*. This nicety, growing out of a commendable love for method, seems somewhat in excess of what is required, inasmuch as differences of degree, dependent on a variety of causes, many of which are by no means constitutional, present us at times with groups of symptoms which cannot be referred to typical or other special varieties, but partake of several of the subdivisions. Indeed, too, our author states that the student must not expect to find the first three forms always clearly defined; on the contrary, they are apt to run into one another, or their special features may be more or less combined. Typical cases of disease, when not immediate clinical transcriptions in the strictest sense of the term, as rarely happens, are often ideal impressions of a series of cases from which a certain sequence of phenomena is deduced, without being susceptible of precise verification at the bedside. A typical case of diphtheria as described by the reviewer, for instance, would include the symptoms relegated to the inflammatory form of the disease in the work under discussion; those due to active hyperæmia, acute pharyngitis, tumefaction of the tonsils, enlargement and hyperæsthesia of the glands at the angle of the jaw, and so on.

Taking together the groups of symptoms in the first three divisions, we find no reference to the condition of the respiration, the nocturnal wakefulness and restlessness, and the cerebral manifestations in young and feeble children. The rapid rise in temperature and pulse-rate is duly noted, and it might be inferred, from want of direct allusion, either that there was no increase in the rate of respiration, or that it retained its normal proportionate relation to the pulse-rate as in febrile disorders generally; while it is a common point of comment that typical diphtheria is characterized by acceleration of the heart-beats without proportionate increase of the respiratory acts. The objective symptoms are unusually well described. Gangrenous diphtheria is said to be rare in Great Britain, except as a secondary phenomenon following scarlet fever, and appears to be more uniformly fatal than in the United States.

Chronic diphtheria, of which but little is known in this country, is described by a brief record of a number of examples, eleven of which came under the author's care in 1863-4, all walking cases and not much debilitated. There was laryngeal deposit in three of them; constant albuminuria in two, and intermittent albuminuria in two; the longest duration having been three months, the shortest seven weeks, and the average nine weeks. Mechanical removal of the

false membrane was in all the cases followed by bleeding, and quick reproduction of the deposit. Among cases quoted from other observers, two are mentioned from the Parisian Hôpital Sainte-Eugénie, in which false membranes were expelled for eight and ten weeks, respectively, after the performance of tracheotomy for laryngeal diphtheria.

In discussing the paralytic sequelæ of diphtheria, it is stated that in rare cases paralysis of the larynx may occur without implication of other structures, and that this paralysis may involve the whole muscular apparatus of the larynx, or may be limited to single muscles; the adductors (which close the glottis) generally suffering in instances of the latter sort, and often as to one cord only. Two cases of permanent paralysis of the recurrent nerve, following diphtheria, have come under the author's notice. The entire chapter on paralyses is one of the most valuable in the book.

The differential diagnosis of diphtheria from simple sore throat, scarlet fever, confluent herpes of the throat, acute tonsillitis, and acute laryngitis, is fairly discussed; but an opinion that herpes has no tendency to spread beyond the seat of its first efflorescence appears to the writer far too absolutely expressed.

Twelve pages are devoted to the chapter on pathology. No special significance is attributed to the parasitic phenomena of the deposit, and this is in accord with the opinion of our most reliable pathologists. In seven cases examined by the author for epiphytes he discovered the fungus in five, "in every case, however, in the superficial layer of the lymph." It is unnecessary to follow the author further in this interesting chapter, which, like all the others, gives due credit wherever it belongs; but we may record his conclusions, which are that the *primary septicæmia* is due to the specific poison, while absorption from the decomposing lymph is no doubt a cause of *secondary infection*; and that the local symptoms (the false membrane with its parasitic growth) must be regarded as the first evidence of constitutional poisoning, in fact as the first of the secondary phenomena.

In regard to prognosis, the special symptoms of grave import are stated to be high temperature, extreme prostration, hemorrhages, or urgent vomiting at the commencement of the attack, indicative of extensive general infection; and, other things being equal, the prognosis is serious in proportion to the thickness and extent of the exudation; while prostration and a tendency to syncope are alarming signs at any period of the attack. The presence of albumen is not considered a symptom of much importance. Dr. Wade, however, to whose recognition of this symptom the profession is chiefly indebted for a knowledge of its significance, considered impairment of the renal function always of grave augury; and it is generally regarded as an unfavourable indication, fatal results being apprehended whenever albumen is very abundant.

Sixteen pages are devoted to the important subject of treatment. Supporting treatment is advised, with free ventilation, and warm and moist air, and a bedroom temperature of from 60° to 65°—some degrees lower, therefore, than is usually recommended in the United States. Especial attention is directed to the importance of "feeding during the night when the vital power is usually at its lowest ebb"—a point well taken. The use of alcohol is recommended, not invariably, it is true, but at times, "with a boldness rarely needed in other forms of disease," a sentiment with which many of our most competent practitioners are in full accord. The first intimation of failure of the heart is designated as the signal for the unsparing use of that drug; and attention is directed to the importance, at the same time, of keeping the patient with his head low, and interdicting any movement whatever. The value of the various remedies in most commendation is briefly and fairly discussed, preference being given to iron as undoubt-

edly the most useful recuperative agent. Thirty minims of the tincture of the perchloride of iron, every two or three hours, are recommended for an adult, and proportionate doses for children, combined with glycerine, and diluted with water. The occurrence of headache, with high temperature, vomiting, and symptoms of septic poisoning, are regarded as indications for quinia in full doses, not to be persisted in, however, if benefit fails to result in thirty-six or, at the most, forty-eight hours. It is the belief of the writer that too much is often expected from quinia in diphtheria, and that its continuance, when not positively beneficial, induces unfavourable perturbation of the nervous system. As to mercury, it is stated that its general influence rather promotes the spread of the exudation than checks it. The author has found distinct benefit from using the *perles* of copaiba in catarrhal cases, but does not state that he administers the drug in the large doses employed by Trideau and others. Chlorate of potassium, so much employed in the United States, is mentioned among general antiseptics as having the general weight of evidence very much in its favour; ten to twenty grains being indicated as the dose, repeated every two or three hours. Sulphocarbolates have proved of service in the author's hands in the *secondary* poisoning of diphtheria, but have appeared to him quite useless in the *primary* septicæmia. Salicylic acid is mentioned as having been of apparent advantage, one to two teaspoonsful of a solution, as follows, being recommended every three hours: R. Acid. salicylic. ʒiiss; Spt. rect. ʒijss; Aquæ destill. ad ʒiv; M. Ft. liquor. Senega, carbonate of ammonium, and the balsams are mentioned as useful expectorants.

With regard to local treatment it is remarked that "the profession has given up the use of caustics altogether, being convinced that they rather aggravate than check the local process." The author now seldom uses a local astringent except iron, which acts topically, also, when employed as a constitutional remedy.

Of all local solvents, lactic acid is considered the most reliable. The author generally applies it freely with a brush, or by means of a piece of lint attached to a wooden rod; and he has never met the inconvenient results from its use described by Küchenmeister—ulceration of the mucous membrane of the lips and mouth. Lime-water is said to be useful when the false membrane is not very thick. The use of the fumes from lime in process of slaking, the very valuable suggestion of Dr. Geiger, of Dayton, Ohio, so much practised in the United States, is not mentioned.

Passing much interesting matter on the local use of antiseptics, with which the readers of the Journal must be familiar, attention may be directed to a new method of local treatment, apparently original with the author. This consists in the application of certain *varnishes*, which, by exclusion of air from the false membrane, appear to exert antiseptic influences. The author has tried gum benzoin, gum tolu, mastich, and resin, which may be dissolved in rectified spirit or in ether, or in a mixture of the tincture of the gum or resin with ether. Preference is expressed for the ethereal solution (1 in 5), and for tolu as the pleasantest to the patient, and the most lasting as a varnish, so that it has to be least frequently applied. Before making these applications, it is directed that the surface of the false membrane should be dried with blotting-paper.

The use of pellets of ice in the mouth, and the application around the neck of bags or bladders of ice is recommended as especially indicated for relief in the first stage of the disease, particularly when there is much inflammatory tumefaction. As is well known, some pathologists believe that ice retards excessive cell-growth.

Heat is regarded as a useful agent when the false membranes have attained any

considerable degree of thickness, both in the form of hot fomentation externally, and in the form of steam inhalations.

Dr. Prosser James, of London, is credited with having first suggested steam as a remedy in diphtheria, but he is antedated by Wanner (*Du Croup et de son traitement par la vapeur d'eau*, Paris, 1834). As is well known, steam inhalations have recently been strongly advocated by Oertel, of Munich, to precipitate a suppurative process beneath the false membrane and thus detach it; and in this view he has the support of our author. It is not unlikely, however, that, when employed sufficiently early, these inhalations keep the exuded or cast-off matters diffuent, and thus more easily detached by expectoration; and if administered in the fumes of slaking lime there is an additional advantage in the simultaneous penetration of some of the innumerable particles of suspended lime beneath the edges of the false membrane at many points, prying it up mechanically, as it were, and thus providing inlets for access of the steam which effects the detachment subsequently. There is no doubt as to the benefits to be obtained from steam, whether alone or mingled with lime, as an agent in detaching the membranous products, especially when occluding the air-passage.

Chapter IX. is entitled "Laryngo-tracheal Diphtheria, formerly called Croup." Here we see that our author, with the majority of his professional colleagues, believes in the identity of croup and diphtheria. The usual arguments for this opinion are presented. The fact that the general symptoms in croup are less severe than when the membrane is thrown out on an extensive portion of the pharynx is explained on the theory that the septic symptoms are in part secondary to the local processes. "For whilst the lymphatics of the mucous membrane of the soft palate, of the tonsils, and of the back of the pharynx have very free communication with the numerous glands below the angle of the jaw, the absorbent vessels of the mucous membrane of the larynx and trachea are conveyed only to the solitary gland just below the greater horn of the hyoid bone, and the small gland at the side of the trachea." This application of the important anatomical fact demonstrated by Luschka, and duly accredited to him here, is novel to the writer; and certainly seems to show that "there is much less liability to general infection when the local process has seized only on the" larynx and trachea. Still, however, there are many observers who claim to make clinical distinctions between croup and diphtheria, as demonstrated at the bedside. One is the retention of the normal relation of the respiration to the pulse in the febrile condition, alluded to, in an earlier portion of this article, as not being maintained in typical cases of diphtheria; others are that the pulse is often strong and hard, the heart not depressed; that albumen is rarely in the urine; that croup is not followed by paralysis, and some further points of minor consideration. Our author disposes of two of the most important in the group by stating that albuminuria is often present in croup, and that paralysis is occasionally met with in cases that survive. Amid all these doubts and uncertainties who shall decide? When partisans of both views attend undoubted cases of inferred croup together, and report on them alike—then, and not until then, can this question be determined. The subjective and objective symptoms, laryngoscopy included, are well presented, and the points of differentiation from catarrhal laryngitis and laryngismus indicated. The dyspnoea is referred to the inflammatory tumefaction and plastic exudation, which give rise to spasm of the adductors. Paralysis of the abductors is denied; yet we have the authority of Niemeyer and others that they have observed it in the laryngoscopic image. In reference to treatment, it is to be noted that direct mechanical attempts at removing loose membrane from the larynx are advised, the appliance used by the author being a

laryngeal-brush of squirrel-tail, the hairs of which cover the sides of the brush, and present upward.

In discussing tracheotomy, the performance of which is justly considered an important duty in certain cases, attention is properly directed to the extreme importance of withdrawing any loose false membrane immediately after the operation, and to the necessity for careful supervision of the after-treatment.

The short chapter on Nasal Diphtheria does not call for comment. A few pages on Secondary Diphtheria close this interesting volume. The diseases in which the manifestation occurs, as abridged from a table by Sanné, are measles, scarlatina, whooping-cough, typhoid fever, smallpox, nettle-rash, bronchitis, pneumonia, pleurisy, tuberculosis, and various cachexiæ (serofula, chronic diarrhœa, etc.). The treatment, local and general, must be the same as in the primary disease.

The increasing importance of diphtheria in a clinical and sanitary point of view, is such that every valuable contribution from a reliable source merits full consideration; and as the little volume of Dr. Mackenzie is both valuable and well-fathered, it has not been deemed improper to devote considerable space to an exposition of the character of its contents. It is hoped that the summary given will induce all our interested readers to find a place for it in their working libraries.

J. S. C.

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ART. XXII.—*Recent Works on Medical Diagnosis.*

1. *Clinical Diagnosis; a Handbook for Students and Practitioners of Medicine.* Edited by JAMES FINLAYSON, M.D., Physician and Lecturer on Clinical Medicine in the Glasgow Western Infirmary, etc. With 85 illustrations. 12mo. pp. 546. Philadelphia: Henry C. Lea, 1878.
2. *Differential Diagnosis; a Manual of the Comparative Semeiology of the more Important Diseases.* By Dr. F. DE HAVILAND HALL, M.D., Assistant Physician to the Westminster Hospital, London. American edition, with extensive additions. 8vo. pp. 205. Philadelphia: D. G. Brinton, 1879.
3. *A Manual of Physical Diagnosis.* By FRANCIS DELAFIELD, M.D., and CHARLES E. STILLMAN, M.D. Quarto, pp. 30. New York: William Wood & Co., 1878.

To most of our readers it will probably seem trite to say that there can be no correct therapeutics in the absence of diagnosis, and that consequently the latter is one of the most important branches of the medical art; but it would appear that all do not hold this opinion, since we recently heard the contrary of this proposition gravely maintained. That it may sometimes be necessary to treat symptoms before an accurate diagnosis can be made, all will admit; but it will scarcely be contended that this is desirable, or that it is often necessary. For ourselves, we hold that it is more important to teach students how to recognize the different forms of disease than how to treat them, having witnessed, in the course of a score of years of practice, some decided changes in the management of disease. The art of diagnosis, on the other hand, while it has improved, has undergone no fundamental change during this time; and while our methods of examination have increased immensely in the last fifty years, it is questionable whether we do not sometimes lose by neglecting those upon which our predecessors were accustomed to rely. These few remarks seem to be called for by the almost simultaneous appearance of three books on diagnosis—a sufficient proof of the



high estimation in which it is held by the profession generally. Without further prelude we shall proceed to notice the books separately.

1. Dr. Finlayson has been aided in the preparation of his Handbook by several collaborators. Thus Prof. Gairdner contributes an excellent chapter on the Physiognomy of Disease; Prof. Stephenson one on Disorders of the Female Organs; Dr. Robertson one on Insanity; and Dr. Gemmell chapters on the Sphygmograph, and on the Physical Examination of the Chest and Abdomen. Dr. Joseph Coats, too, in addition to furnishing some Notes on the Method of Performing Post-mortem Examinations, is the author of the article on the Examination of the Fauces, Larynx, and Nares. A book coming from such hands is not likely to be even an indifferent one; and such is not the case.

In expressing an opinion of the book as a whole, we should say that it is more likely to be useful in fitting the student or young physician to undertake the examination of a patient, than as a book of reference when he finds himself confronted with a difficult case. Thus in no part of it are the leading features of two or more diseases, having points of resemblance, brought into marked contrast with one another, or placed side by side in tabular form for the convenience of study, as in one of the other books whose title heads this notice. The student will find, on the other hand, the methods of examining the various organs of the body very carefully explained, so that he will know before he comes to his patient what symptoms he is to expect, by which, as the author expresses it, "the case is thus put in a fair way for a diagnosis, when this becomes possible."

The book, as a general rule, is very fairly representative of existing knowledge. In the article on nervous disease there are, however, one or two deficiencies. Thus the author seems to make no distinction between the shaking palsy of the aged and multilocular sclerosis, for an accurate description of which we are indebted to Charcot. If there is any allusion to sclerosis of the lateral columns it must be a very brief one, for it has escaped our notice.

2. A year or two ago, Dr. De Haviland Hall wrote a book entitled *Synopsis of the Diseases of the Larynx, Lungs, and Heart*, which we have no doubt, judging from the reputation of its author—for we have had no opportunity of examining it—was an excellent one. This book the American editor has added to, so as to make it include, he says, all the more frequent and more important diseases. In doing this it became necessary to change its title, but Dr. Hall's name alone appears upon its cover and title-page, so that he must stand sponsor not only for much that he never wrote, but possibly for something that he may not wholly approve of; which, as there is nothing to indicate the new matter, is a liberty which we regret Dr. Hall is without the power to resent. All the more frequent and important diseases are, however, not included in the book; thus there is no allusion made to such diseases as erysipelas and chorea, which certainly occur often enough in every one's practice, and none to Graves's disease, which is an interesting affection, if somewhat rarer than the other two.

Much may be said in commendation of the book. Its plan is excellent; the diagnostic points of diseases bearing the greatest resemblance to one another being arranged in tables placed side by side, in order that the student may compare them readily. In the main the plan is well carried out, but distributed throughout the book are passages which seem to show that the editor, whoever he may be, has derived the greater part of his information from books rather than from bedside observation. In some places, indeed, contradictory statements are made in the tables—a mistake which would hardly have been made by any one engaged in clinical teaching. For instance, on page 28 we are told that the eruption of

rötheln—which, by the way, is not an English word—“fades in about four days *without desquamation*,” while two pages further on desquamation is said to take place in “minute particles of cuticle like scales of fine bran.” The truth in the matter is, according to Thomas, the author of the article on Rubeola, in Ziemssen’s *Cyclopædia*, as follows: There is no desquamation in pure cases of the disease. It does occur, however, when, in addition to the characteristic eruption, there is also one of miliary vesicles. Again, on page 123, we find the editor quoting approvingly a passage from a paper by Dr. A. L. Loomis, in which that gentleman says that catarrhal phthisis, which, we presume, will generally be admitted to be the more frequent form of the disease, is always to be suspected if the illness has begun with the ordinary symptoms of a cold; and, on the following page, giving as the diagnostic points of the period of invasion of the same form, “precursory catarrh, sometimes pneumonia, croup, measles, or other inflammatory disease; cough deepens, proceeding from the trachea to the alveoli and bronchioles, indicated by dark-yellow streaks in the sputum.” These are certainly statements which are hardly compatible with those he makes on pages 128 and 129 when speaking of the general clinical symptoms of phthisis, that the cough is at first dry, and that it commences gradually, without marked disturbance or coryza.

A few typographical errors have here and there escaped the notice of the editor, but the appearance of the book is otherwise very creditable to the publisher.

3. Dr. Delafield has, we think, erred in issuing his *Manual of Physical Diagnosis* in quarto form. The circumstance that it is interleaved, in order that it may be used as a note-book as well as a guide, will scarcely counterbalance the disadvantage of its size to the student, who is expected to carry it with him in his visits to the hospital, or to the physician who needs its aid in his daily practice. Certainly, “those who have to teach the art of physical diagnosis,” for whose use, the author tells us in his preface, it is intended, as well as that of the student of medicine, would prefer—if, indeed, there be any teachers who require its help in the preparation of their lectures—Dr. Flint’s *Compendium of Percussion and of Auscultation*, which can conveniently be hid away in the waistcoat pocket. The book, however, despite its cumbrous size, is an excellent one of its class, the physical signs of the diseases of the chest and abdomen being given as fully as is compatible with its plan. The author attaches, very properly, much importance to the pitch of a sound as an indication of disease; in this, as our readers are aware, following the elder Flint. He applies the term sonorous and sibilant breathing to the sounds which are usually known as sonorous and sibilant râles—a deviation from custom for which it seems to us there is no good reason.

Appended to the volume are drawings, very skilfully executed by Dr. Charles E. Stillman, representing, by means of superimposed plates, the position of the different thoracic and abdominal viscera.

J. H. H.

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ART. XXIII.—*Les Tumeurs Adénoïdes du Pharynx Nasal; leur Influence sur l'Audition, la Respiration, et la Phonation; leur Traitement.* Par le Dr. B. LÆWENBERG. Svo. pp. 74. Paris: V. Adrien Delahaye et Cie., 1879.

THE scope of this admirable work is fully indicated in its title-page. History, Anatomy, Etiology, and Symptomatology occupy the first thirty-four pages,

over fifteen pages being devoted to a most graphic description of symptoms. The latter are, a suppression of the nasal respiration, and its consequences; the altered physiognomy; the ill effects on the pharynx and nasal passages, and the diminished sense of smell. Other evil consequences of a cessation of nasal respiration, and the substitution of breathing through the mouth, are the comparative impurity of air respired through the mouth, stunted growth of the body, snoring, arrested development of the chest, and nasal enunciation, all of which are seen chiefly in children of the lymphatic diathesis, as they are most likely to be affected with these growths in the naso-pharynx.

In adults the ability to sing may be lost, and various reflex diseases in the larynx, dependent upon altered innervation in the muscles, may arise from the pharyngeal affection.

These tumours have a very bad effect on the middle ear. As a consequence of their presence in the pharynx, and the obstruction they exert on the mouth of the Eustachian tube, as well as the irritation they keep up in the pharynx, there may arise two forms of inflammation in the ear, viz., catarrhal inflammation, and the suppurative form with perforation of the drum-head. Before any cure of the aural disease can be effected, the adenoid tumours must be removed or destroyed.

Dr. Löwenberg states that very often the results produced by these tumours in the pharynx are ascribed to enlarged tonsils. The two conditions may exist together, but removal of the tonsils will not relieve the symptoms. Hence the utter failure of this operation to cure deafness. The rhinoscope and the digital examination of the pharynx are indispensable in establishing the diagnosis. The latter method is to be carried out most easily by asking the patient to breathe through his nose, and to throw out his thorax, while the head is thrown back as far as possible. The index finger used in this examination should be oiled, or made bland in some equally good way, before introducing it, and the finger-nail should be pared close. When these growths are in the naso-pharynx, the finger thus used will be found tinged with blood on withdrawal, which is due to the extreme vascularity of these growths. In some cases the pharynx and mouth of the Eustachian tube may be examined by means of long specula (Zaufal's) introduced through the nose.

It will be necessary to make a differential diagnosis between these adenoid tumours of the nasal pharynx and simple chronic coryza, hypertrophy of the tonsils, nasal polypi, and naso-pharyngeal polypi.

The prognosis is always favourable. When alluding to the etiology of these growths the author states that heredity has much to do in their production, and he gives an account of a family in which the mother, thirty-five years old, and four children from six years of age to eight months, were simultaneously afflicted.

The treatment of this adenoid affection of the pharynx is divided into three parts: 1. Care of the general health. 2. Surgical treatment of the tumours. 3. The institution of measures against concomitant or consecutive affections. The first is to be accomplished by hygiene, abundance of exercise in the open air, and gymnastics calculated to stimulate properly the respiration and circulation, as well as the general nutrition. Cold baths, sponging, cod-liver oil, bitter tonics, preparations of iodine, iron, sea-bathing, and saline and sulphurous mineral waters, are also advised. Irritation of the pharynx is to be carefully avoided; consequently all stimulating and hot food or drinks must be prohibited, and alcohol and tobacco avoided. Excessive use of the voice and the respiration of unwholesome air must also be guarded against.

Local treatment is divided into *cauterization* and *ablation*.

Cauterization, repeated often, will usually be sufficient, especially when the

tumours or vegetations are flat or sessile, and hence offer no good purchase for a cutting or constricting instrument. This method is also of great service in children whose parents are unwilling to permit any more severe operation. Of course, the greatest care is necessary in applying any form of cautery to the naso-pharynx. Nitrate of silver, fused on a probe, is preferred by our author. The naso-pharyngeal douche with salt water should always be employed after the use of nitrate of silver in this strong form, and it is also recommended to use a gargle of salt and water. In employing the latter it is suggested by Dr. Löwenberg that the patient throw his head as far back as possible, letting the gargle go down as far as he can without swallowing, and then throw it as high as possible behind the velum. The ablation of adenoid tumours in the naso-pharynx can be accomplished by using a curette with cutting edges, by crushing and constriction, by an annular knife (of Meyer, of Copenhagen), by the instrument of the author, and by means of the galvano-caustic.

The author has employed chiefly the first method and his own. The annular knife of Meyer, which is to be introduced through the nostril, he entirely rejects; very wisely, in our opinion. His own method consists in the removal of these growths by means of a curved forceps with cutting ends. The width of the cutting edge at the end of the forceps is 7 mm. These edges are against each other when the instrument is closed. Its entire length is about 24 c.m., or 9½ inches. It is slightly S-shaped, and the joint is very near the cutting end. This is introduced into the naso-pharynx through the mouth, and is to be kept under the guidance of the eye, aided by the rhinoscopic mirror, when possible; but if this is not possible, the instrument must be guided by the index finger, to the morbid growth. The blades are then to be separated, and one closure of the cutting edges over the tumour will sever it from its attachment, and the growth is generally brought away with the instrument. The hemorrhage is usually copious, but is to be controlled by ordinary means. The galvano-caustic Dr. Löwenberg has never employed.

The treatment of concomitant and consecutive affections consists in the measures taken to correct respiration through the mouth, and its bad results, and the therapeutics of diseases of the ear, which constantly arise in consequence of the adenoid growths in the naso-pharynx. The latter diseases cannot be cured until the morbid growths are removed. For the aural discharge in these cases absolute alcohol has been found of greatest value. This has been used entirely undiluted in some cases, and in others diluted with water in varying proportions. In some cases tannin has been added to it, with apparent advantage. Insufflations of powdered alum have also been used with great benefit in discharges from the ear, constantly met in connection with morbid vegetations.

This brochure is to be considered a very valuable addition to the literature of naso-pharyngeal diseases and their effects, and will amply repay a perusal.

C. H. B.

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ART XXIV.—*Transactions of the American Ophthalmological Society.*  
*Fourteenth Annual Meeting.* 8vo. pp. 140. New York, 1878.

OUR last notice closed with the statement that the next number of the *Transactions* would contain a paper on the spontaneous cure of separation of the retina, by Dr. Herman Althof, of New York, but we are compelled to commence this one with the sad announcement of his premature death. Dr. Althof was one of the founders of the society, and was twice its president, and his high intelligence,

vigorous manhood, and most genial manners made him a general favourite with its members.

Dr. ARTHUR MATHEWSON, of Brooklyn, strongly urges *the use of nitrous oxide* as an anæsthetic in strabismus operations, and reports five cases in illustration. The use of the gas in these cases was suggested by the fact that Drs. Giberson and Rushman, of Brooklyn, had used it in cases of amputation, and found that their patients could be kept under its influence for half an hour without unpleasant consequences. A strabismus operation requires but a few minutes for its performance, and the prompt recovery of the patient from anæsthesia gives the operator the much desired opportunity to test almost immediately the effect produced, and to decide if it is necessary to increase or diminish the effect of the dissection, or to operate on the other eye. The impossibility of doing this is a serious objection to the use of ether or chloroform.

Dr. GEO. STRAWBRIDGE, of Philadelphia, reports I. *Tumour of the Optic Nerve—its removal without enucleation of the eyeball*. Four muscles and considerable conjunctival and surrounding tissue were left intact, and an effort was made to preserve the eyeball. The cornea sloughed, and the lens and vitreous escaped, and the final result was an atrophied eyeball. Microscopical examination showed the tumour to be a glioma. II. *Cyst of the Iris*. The cyst occupied the nasal half of the iris, extending far over into the pupil, and was of one year's growth. The cyst was removed by a free iridectomy; the wound healed rapidly, and the patient had  $V=\frac{2}{80}$ . Microscopic examination showed that "the outer wall consists of the stroma and muscular coats of the iris, the uvea being absent. This was lined with a layer of squamous epithelial cells, swollen and in an advanced stage of fatty degeneration. These cells are free from each other, and are surrounded by granular matter, fat, and cholesterine crystals. It might therefore be classed with certain sebaceous tumours, so called, in which the common cystoid cell is wanting, and one that might be cited in proof of Paget's theory that they are sometimes a new formation." III. *Congenital Malformation of Conjunctiva resembling Pterygium Externum*. "The patient was an infant six weeks old. The corneæ were covered to fully one-half their surface with a growth of conjunctiva extending from the outer lid commissure."

Dr. D. B. ST. JOHN ROOSA, of New York, contributes a paper on *The Relations of Blepharitis Ciliaris to Ametropia*. This article is an appendix to one with the same title which appeared in the *Transactions of the Fifth International Ophthalmological Congress*, and which has already been noticed in this Journal. Dr. R. adds the results of examination of forty-eight cases from the Manhattan Eye and Ear Hospital, and of forty cases from private practice, in nearly all of which there was a low degree of refractive defect. The same author has also given the results of "an examination, under atropia, of the refractive state of eyes with normal vision and which had never been affected with asthenopia or inflammation." The number of persons examined was fourteen, and correct refraction was found in only three; in the others there was hypermetropia of an average degree not very different from that found in the asthenopic cases. The difficulties in the way of making examinations of this kind are obvious, and these statistics perhaps hardly include a sufficient number to justify a very positive conclusion, but so far as they go they are very valuable, and it is to be hoped that they may induce other observers, who have the opportunity, to add to them. Dr. Roosa "still believes that there is much more than a mere coincidence in the frequent occurrence of blepharitis in connection with strain on the accommodation from refractive defects," but thinks there is a tendency to overrate the curative power of glasses. We believe that this is about the correct statement of the case, and, at the risk of being considered regressive, would unite with the author in

calling attention to the danger of adding optical therapeutics to the long list of valuable remedies that have been brought into unmerited discredit by demanding too much for them. The most enthusiastic specialist will find it to his advantage to bear in mind that there may be other causes than refractive defects for headaches, hysteria, chorea, and lachrymal obstruction.

Dr. J. S. PROUT, of Brooklyn, in a paper on *Lachrymal Conjunctivitis, and some of the other injurious effects of Retention of the Tears*, calls attention to the irritating effects of retained tears, the importance of which he thinks is not so generally recognized as it should be. He shows that diseases of the conjunctiva, cornea, and lids are often prolonged by the failure to recognize and treat a slight obstruction of the lachrymal passages.

Dr. HENRY W. WILLIAMS, of Boston, reports a case of *Extirpation of the Ossified Choroid without Enucleation of the Eyeball*. The anterior portion of the eye, including the ciliary region, was abscised, the osseous shell and the fluid vitreous were removed, and the edges of the sclerotic were brought together with sutures. Dr. W. thinks that this procedure affords ample security against the danger of sympathetic inflammation of the other eye, and that a better support for an artificial eye is obtained than after enucleation.

Under the head of *Cases illustrating two rare diseases of the Eyelids*, Dr. CHARLES S. BULL, of New York, reports a case of gummy infiltration of the tarsus, and one of amyloid infiltration of the lid and orbit. In the former case the patient recovered completely under treatment by mercury and potass. iod.

The subject of the amyloid affection, a child four and a half years of age, ultimately died with brain symptoms from extension of the disease from the orbit into the cranial cavity. The disease commenced with redness and swelling of the left upper lid near the orbital margin. The swelling increased and became tense and hard, and assumed the appearance of cellulitis. There was marked exophthalmus, and the cornea ulcerated and sloughed. A deep incision was made into the orbit but no pus was met with. The preauricular gland was indurated and swollen, and there was a discharge from the left ear. Enucleation of the contents of the orbit was advised but was declined by the patient's parents, and no post-mortem examination was allowed. A small piece of tissue, removed from the orbit when the incision was made, was examined microscopically. There was "in some isolated spots a luxuriant granulative tissue. There were very few vessels, and in those which existed the walls were very much hypertrophied, mainly at the expense of the calibre of the vessels, which in some could scarcely be distinguished. There was very little trace of either connective or adipose tissue, but the main mass appeared to be a homogeneous, structureless infiltration."

Dr. BULL also reports a case of *Syphilitic Gummata of the Conjunctiva*, occurring in connection with gummata of the sclera.

*A Case of Spontaneous Cure of Subretinal Effusion* is reported by Dr. DAVID WEBSTER, of New York. It occurred in the practice of Dr. C. R. Agnew. The patient, a clerk, 47 years of age, highly myopic, had only sufficient vision to count figures at the distance of one foot. He was advised to try rest in the supine position, and lay on his back in a darkened room for twenty-three days. At the end of that time he had  $V = \frac{1}{200}$ , and no separation of the retina could be seen, though there were some floating bodies in the vitreous. Vision continued to improve, and in two years afterwards he had  $V = \frac{20}{100}$ , with  $-\frac{1}{2\frac{1}{2}}$ . The visual field was complete.

Dr. J. J. B. VERMYNE, of New Bedford, Mass., contributes the report of *A Case of Multiple Rupture of the Circulus Iridis Minor, without other Injury to the Eyeball*, and gives an account of the literature of the subject, from which it

appears that the accident is a rare one. The patient was struck violently across the nose and eyebrow by a piece of wood from a turning-lathe. There was a downward coloboma extending nearly to the attachment of the iris, and a little above it, on the nasal side, a small notch in the edge of the pupil.

A *Tumour of the Conjunctiva, Simulating Cyst*, is described by Dr. RICHARD DERBY, of New York. It was observed on the nasal side of the eye of a healthy child. The tumour was removed, and found to consist of connective tissue fibres and hypertrophied conjunctival tissue.

Dr. L. S. DIXON, of Worcester, Mass., reports *Cases of Sarcoma of Choroid, and Retinitis Albuminurica*. The first was that of a healthy man of 50 years, who had been suffering from severe pain in the left eye for two months. There was slight episcleral injection on the outer side of the cornea, and tenderness on pressure over that region, but vision remained normal. There was no increase of tension, and the ophthalmoscopic appearances were natural. Vision afterwards failed, from haziness of the vitreous, and was finally reduced to light perception, and the pain increased in intensity. Enucleation was performed with entire relief from pain. There was a tumour, or thickening,  $\frac{1}{2}$  of an inch thick, occupying one-third of the circumference of the ciliary region on the outer side, and involving only the ciliary body and choroid. It proved to be a round-celled pigmented sarcoma. Six months afterwards a slight redness appeared in the ciliary region of the other eye to the nasal side of the cornea, with occasional twinges of pain. The pain became more constant and intense, and the history of the left eye repeated itself in the right. The patient died, apparently, from exhaustion, just a year after the enucleation of the eye first affected. There was no post-mortem.

In the case of albuminuric retinitis, the disease of the retina was fully developed in both eyes before there were any symptoms of the constitutional affection. There was but the faintest indication of albumen in the urine, and hyaline casts were found only after repeated and careful microscopical examinations.

The patient died with convulsions and hemorrhages about a year afterwards.

The next paper is on *Intraocular Circulation: Rhythmical Changes in the Venous Pulse of the Optic Disk*, by Drs. O. F. WADSWORTH and J. J. PUTNAM, of Boston. Changes in the pulsating portion of the larger branches of the vena centralis, were found to afford the most satisfactory indications of variation in the retinal circulation.

The following observations were made: I. *Compression of the Jugular Veins*. Its effect on the intraocular circulation was so slight as to be considered doubtful. II. *Pressure on the Carotid of the same side with the Eye examined* caused a cessation of all pulsation of the veins on the optic disk, and as soon as the pressure was relaxed the veins refilled, and the normal pulsation returned. This, the authors think, favours the theory of Donders, that the venous pulse on the disk is due to compression of the vein at its point of exit at the time of the arterial diastole, and a consequent backing up of blood. III. *Inhalation of Amyl Nitrite* caused a reduction in size of the vein at its pulsating point. The pulsation did not cease, but was very much diminished. IV. *Rhythmical Changes in the Venous Pulse*. "Besides pulsating in the usual manner, the vein, at the point alluded to, was seen to dilate and contract gradually, in periods corresponding to about five respirations. The vein thus seemed to be pulsating under the influence of two distinct systems of waves, one synchronous with the cardiac impulses, the other, the long waves, due perhaps to changes in arterial tension."

Dr. C. R. AGNEW, of New York, writes of *Cases of Ophthalmic Disease, in which enforced exposure to Light and Air was Salutary*, calling attention to the fact that injury is often done, when photophobia is the prominent symptom, by

yielding too much to the patient's desire to shield the eyes from light. In an obstinate case of keratitis, with intense photophobia, in a child six years of age, a cure was effected by frequent etherization (seven times in two weeks), and exposure of the cornea to light and air. Good results had also been obtained in older subjects, by forcible exposure without etherization.

The hygienic effect of light in the chamber occupied by a patient, is of great importance; and Dr. Agnew thinks it is a question whether light should ever be excluded, and whether it is not better, when the eyes do need protection, to secure it by bandages, shades, or glasses.

Dr. VERMYNE, of New Bedford, Mass., reports a case of *Photopsy from an Injured Eye, persisting six months after Enucleation*.

Dr. WM. THOMSON describes *A Practical and Rapid Method, with an Instrument, for the Diagnosis of the Refraction*. It would be impossible to give a definite idea of this ingenious addition to our means of diagnosis, without the use of diagrams, and more space than is at our disposal. We must, therefore, refer those who are interested in the subject of refraction, to the paper itself. The test is based upon the measurement of the circles of diffusion upon the retina, which result from defects of refraction. If an eye is emmetropic, a point of light will form a sharp image upon the retina without circles of diffusion, and when two such points are approached towards each other, their images will not be fused until one light is actually in contact with or behind the other. If the eye is myopic or hypermetropic, each point of light will be represented on the retina by a circle of diffusion, and by measuring the distance between the lights when the margins of these circles come in contact, their diameter can be estimated and the degree of myopia or hypermetropia calculated.

Dr. JOHN GREEN, of St. Louis, suggests *some improvements in instruments and appliances for diagnosis*. The original edition of his well-known tests for astigmatism having been exhausted, some improvements and additions have been introduced, the most important of which is the construction of the diagrams on a larger scale. There are also some "stereoscopic diagrams for testing binocular vision," which it would be useless to describe without the cuts.

The next paper is on *The Etiology of Retinitis Pigmentosa, with cases*, by Dr. DAVID WEBSTER, of New York. He gives nineteen cases from the practice of Dr. C. R. Agnew, and three from his own. The points principally dwelt upon are consanguinity of parents, and heredity. Consanguinity was traceable in only three out of the twenty-two cases, or 13.6 per cent., which he thinks does not very much exceed the general percentage of intermarriage of blood relations in the United States. In addition to this consideration, in one of the three cases heredity undoubtedly existed, and in another it was probable; so that his cases hardly tell in favour of consanguinity as an active cause. Heredity was known to exist in seven cases, and was suspected in several others. Three of the patients were members of the same family, and three others had brothers, sisters, or cousins with the same disease. There was suspicion of inherited syphilis in only one case.

Of nine cases reported in this Journal for 1873 (p. 415), but two were the only members of their family affected; heredity could be traced in two, and consanguinity of parents in only one.

Dr. GEO. T. STEVENS, of Albany, reports the *Enucleation of an Eyeball, followed by immediate and marked reduction of the amount of urine passed, in a case of Diabetes Insipidus*, and thinks we have here "the phenomenon of an obstinate and dangerous disease of distant organs, having for its exciting cause an injury to the ciliary body, almost entirely relieved by the removal of the eye, but continued in a modified degree by a neuritis of some of the branches of the ophthalmic nerve acting as a secondary centre of irritation." G. C. H.



ART. XXV.—*Transactions of State Medical Societies.*

1. *Proceedings of the Medical Association of the State of Missouri*, 1878.
2. *Transactions of the Minnesota State Medical Society*, 1878.
3. *Transactions of the Medical Association of Alabama*, 1878.
4. *Transactions of the Colorado Medical Society*, June, 1877, and June, 1878, pp. 107. Denver, Col., 1878.
5. *Transactions of the Medical Society of the State of West Virginia*, May, 1878, pp. 120. Wheeling, W. Va., 1878.
6. *Transactions of the Medical Society of the State of Pennsylvania*, May, 1878, pp. 511. Philadelphia, 1878.

1. WE find in the *Missouri Transactions* an excellent essay by Dr. H. N. Spencer, in which he directs attention to the great importance of watchfulness over the ears, during the course of the exanthemata, in order to prevent, or treat during the curable periods, troubles which so rapidly tend to become incurable, and even dangerous to life. The disposition of disease to spread from the throat through the Eustachian tube is too little remembered in practice. When grave inflammation has been set up in the ear, he recommends prompt incision of the membrane of the tympanum, if other means do not speedily relieve. Many cases of deafness after scarlatina could, he believes, be thus prevented.

In an article on simple conjunctivitis, Dr. Michel deprecates the use of astringents. When acute, the disease is self-limited. Constitutional treatment in some cases, rest, protection from irritation by light, heat or cold, or dust, seem to him the rational procedure. Counter-irritation does no good.

Dr. Howlett reports a case of extra-uterine foetation. The child died in the eighth month, but was not removed till two years later. The weight of the foetus when taken away by abdominal incision was one and three-fourths pounds. Patient did not miss a meal nor suffer a pain after operation, and in four weeks was up and out of doors making calls.

An article by Dr. Moses on the Hystero-Neuroses, papers on local mineral springs, and several others, make this number quite a profitable one.

2. Two cases of hepatic abscess are reported in the *Minnesota Transactions*. In both there were few of the classic signs of abscess. Both were treated by aspiration, with relief, and reasonably prompt recovery. Among other cases, is a fatal one of purpura in an infant; and that of a little girl of thirty months, concerning whom the question is asked, "was she hysterical?" on account of a confirmed propensity to devour mud and plaster.

A correspondent of the Society, now resident on the Southern California coast, reports the remarkable ease and quickness with which wounds there heal. He does not find speedy convalescence from acute disease; indeed, is inclined to think recovery rather less rapid than in Minnesota.

An interesting discussion is reported as to the influence upon the foetus of opiates given to the mother. Much difference of opinion was discovered.

The loveliness of jury-trial is here illustrated in the account of conviction, and victimization in \$500 damages each, of an imprudent devotee of Venus and a physician, upon a monstrously improbable and unproved allegation of an abortion brought on without consent of the woman. and, *she says*, under chloroform forcibly administered, in a hotel-room at mid-day. The woman was a prostitute, who had wound her toils around an unwary man, and thus sought to black-mail him. How any decent twelve men could look a judge in the face while rendering such a verdict, we are unable to comprehend.

A queer case of hallucination, and insane impulse, is contributed by Dr. J. E. Bowers. A young woman, just developed from childhood, of somewhat feeble intellect, came into the house with an excited story of a man who told her that the barn was to be burned down. The building was watched, but no confirmation of the girl's idea was obtained. But next morning she slipped out of the house at breakfast time, and fired the barn herself. We do not think, however, that it is at all certain there was any "hallucination" about it. An insane impulse very likely prompted the invention of the story, as well as the execution of the deed.

Dr. Phillips reports an extreme case of amniotic dropsy. Three "ordinary buckets" of the waters were mopped up from the floor, and at least one more is reported to have been lost.

Dr. Attwood reports cases of sympathetic inflammation of uninjured eyes, respectively seven, twenty, and twenty-one years after the injury to the other organ. Bits of steel from a turning lathe were in each case the cause of the trouble.

Remembering the extraordinary explosion recently occurring in the flour mills of a Western city, the following case has great interest. A "flue," so-called, apparently a conduit for flour or grain, extended from the upper story of the mill down to a distance of thirty feet. Except for the open top, the flue was airtight. For some purpose of repairing, a man lowered himself and a kerosene lamp from the open mouth down towards the bottom. When within six or eight feet of the bottom, an explosion of "flour or gas" took place, "filling the entire space from bottom to top with flame." The man was frightfully burned, but had the rare presence of mind to close his mouth and eyes, thereby avoiding mortal injuries, and loss of sight. On the idea that the explosion was from some gases or other product generated by the working of the mill, as was supposed in regard to the terrible disasters in Minneapolis, it is to be noted that in this case the mill had been idle for several days.

Dr. Mayo contributes a case of purpura hæmorrhagica in a girl of twelve years. Turpentine seemed to relieve and even cure the disease.

3. The sensible and well-written address of President Brice, of the *Alabama Society*, reminds us of the general fact that "hifalutin" is much less prevalent in such efforts than it was in past times. There seems to have been a recognition of the truth that flowery and gushing oratory, however effective and desirable in an after-dinner effort directed to the ears of an assemblage, does not always very well bear the cold lead of the printer.

Dr. Jerome Cochran has an interesting paper on Hermaphroditism. The same writer states and defends the opinion that "puerperal fever" does not exist as an individual entity. If we understand him, he regards such fevers, so-called, as symptomatic, or "surgical"—caused by inflammatory conditions of various organs, or possibly some ordinary fever chancing to appear, and not a specific disease. He presents his argument very forcibly.

As the "Association" constitutes the State Board of Health, a portion of the volume is appropriately devoted to essays upon sanitary and hygienic subjects.

We find here a tolerably full report of a convention, representing thirteen cities on the South Atlantic and the Gulf, which was called together with the view of obtaining more effective quarantine regulations, especially by putting the whole matter under Federal control.

Articles on Endometris and on the Ophthalmoscope make up a creditable, though not a strikingly original publication.

4. From the *Colorado Transactions* we learn that the wonderfully wholesome influences of the mountain air do not protect from that terrible scourge of young families—scarlet fever. No very exact statistics are given, but we infer from the very marked attention given to this disease, that its prevalence in Denver is at least as great as in our Eastern cities. Much discussion was had as to the probable causes of the constant prevalence of the malady; but no one theory of causation met with general acceptance. A committee appointed to consider the subject report the curious fact that adults are more frequently attacked with scarlatina in Denver than in Eastern cities.

Although certain valleys and plains in Colorado experience a very high degree of heat in summer, yet sunstroke is reported to be wholly unknown. We believe the gentlemen who write on this subject are right in attributing to the extreme dryness of the air, their entire exemption from the fatal effects of high temperature. Dr. Lemen quotes in proof of the extraordinary dryness of the atmosphere in the Rocky Mountain States many of the statements which we laid before our readers in a notice of a recent volume of U. S. A. Medical Reports. He suggests the possible advantage, in treating cases of sunstroke, of producing an artificial atmosphere, deprived of its moisture, by the absorbent action of certain chemicals having a strong affinity for water.

Dr. James Reed, of Colorado Springs, considers the influence of the climate and altitude of this health-resort upon the special symptom of pulmonary hemorrhage. It has been believed that the rarefied atmosphere at six thousand feet above the sea promoted bleeding from diseased lungs. From an apparently fair examination of the recorded cases which have come under his notice, the Doctor concludes that this idea is unfounded.

Dr. Beshoar believes early washing of infants to be injurious. Inunction of lard he thinks safer and better during the first eighteen hours of life.

A successful replacing of a uterus after three years' inversion is reported by Dr. Buckingham.

5. Dr. Boyd, of the *West Virginia Society*, reports a successful diagnosis and treatment of an extra-uterine pregnancy. At about three months after conception the cyst formed on the Fallopian tube was punctured by a trocar, causing a profuse discharge of amniotic fluid. A second puncture, a fortnight later, produced an escape of fetid matter and of fragments of the fetal skeleton. After some two years the discharge ceased, and the wound healed. Very little constitutional disturbance occurred at any time.

Dr. Brownfield gives the general facts of a case where twenty-two years elapsed between the death of a fetus and its discharge from the cyst on the Fallopian tube.

Dr. Frissell, the veteran surgeon of Wheeling, continues his instructive retrospect of cases. Three cases of "infantile paralysis" came under his notice during three days, all caused by sudden chill, after exposure to great heat. Several cases of cerebro-spinal meningitis, and of different inflammatory lesions, are traced to the same source—imprudent efforts to reduce the bodily heat in extremely hot weather.

Dr. Frissell lays much stress on the earliness of treatment in all forms of "club-foot." He is strongly inclined, too, to value adhesive straps, and plaster-of-Paris bandages, more highly than the expensive paraphernalia of the instrument makers.

6. One of the formal addresses, before the *Pennsylvania Society*, is by Dr. D. Hayes Agnew, upon Errors of Diagnosis. Perhaps only a man of character and

reputation, so assured, could venture to speak so plainly on this subject. Recognizing the fact that many blunders might have been avoided by more careful consideration of all the symptoms, he distinctly states that some mistakes are inevitable; he claims no exemption from the common lot; he expects to make mistakes as long as he lives. "One mistake, to a wise physician," he adds, "is more instructive than twenty successes."

Dr. Curwen, in an article on the care of the insane, expresses the views of humanity and of common sense, as contrasted with some of the foolish conceits and notions of the time. One fact he mentions is peculiarly suggestive: New York State has in forty years spent two and a quarter million of dollars *less* for the lodging and treatment of its insane than has been lavished upon the unfinished capitol at Albany.

Dr. Halberstadt, of Pottsville, urges the more general use of anæsthetics in labour cases.

Dr. Dyer, of Pittsburgh, contributes a careful study of Sympathetic Ophthalmia, with very full references both to the older and the more recent authorities. The same gentleman advocates very earnestly the general adoption by the profession of the metric weights and measures; and he obtained from the Society an endorsement of his efforts to popularize this system.

A very instructive case is described by Dr. Murdoch, in which fracture of the femur was complicated with a dislocation of the head of the bone downward upon the ischium, "in the groove between the lower lip of the acetabulum and the tuberosity." The dislocation was discovered only upon a post-mortem examination, although the patient had been seen by "more than a score" of surgeons, "some of large experience." The complication here noticed is very slightly mentioned even by the most classical writers on the subject of hip-joint troubles. Hamilton and Bigelow gave the writer no aid in the diagnosis. One symptom he believes to have some diagnostic value—a fixedness of the upper fragment.

Dr. Chas. K. Mills directs attention to the danger of confounding the symptoms of psoas abscess with those of sciatica, or other neuralgic ailments.

Prof. Wm. Pepper gives description and illustrative cases of what he regards as "catarrhal inflammation of the bile-ducts." He recognizes both an acute and a chronic form of the disease. Nitrate of silver is warmly recommended as exerting a curative influence on the diseased mucous membrane.

Under the title of the "Address in Hygiene," Dr. Benj. Lee treats at some length of the epidemic of diphtheria which so terribly afflicted Pittsburgh in 1877-8. The mortality during a given period—eight months, we believe—was greater in absolute numbers than ever occurred in Philadelphia, with its sixfold greater population. Sewer gas is the cause here assigned for the prevalence of the disease.

Among the special reports from county medical societies, we notice that Crawford County assigns 19 deaths to diphtheria out of a total mortality of 30. As a standard of measurement we may mention that the deaths from consumption were only five.

The report from Northampton County includes a case of fatal tetanus occurring ten days after treading on a fish-bone. The wound had apparently healed kindly, but death came twenty hours after the first signs of the disease.

From Mifflin County we receive a report of fever cases, seven in one house being attacked, besides three persons having intercourse with the stricken family, and some thirty more in the same village. The reporter regards the disease as typho-malarial, rather than as pure typhoid. While its first cause is considered to have been the drainage of a meadow, formerly flooded, the trouble was believed to be eminently contagious.

Dr. Nancrede contributes an admirable notice of the late Dr. Francis Gurney Smith.

Dr. Bland, of Schuylkill County, met with five cases of typhoid fever in a family of ten, and he attributed the disease to water contaminated with fecal matter. Upon ceasing the use of the suspected well, the disease spread no further.

Dr. Humphreys, of Westmoreland County, from his own experience, speaks warmly in favour of the "bicarbonate of soda treatment" for burns.

B. L. R.

ART. XXVI.—*Clinical Lectures on Diseases of Bone.* By C. MACNAMARA, Fel. Call. Univ.; Surgeon to the Westminster Hospital, etc. 12mo. pp. viii., 298. London: Macmillan & Co., 1878.

VOLUMES of "Clinical Lectures" are, as a rule, hasty reviews of the subjects which they propose to discuss, and greatly lack scientific precision and accuracy; in fact, they seem too often to be mere printed reports of the author's extemporaneous talks to students. In the present instance this is not the case; the preface states that all the lectures have been revised, and a perusal will convince any one of the truth of the assertion. Exception may, perhaps, be taken to the title, which would seem to indicate that the reader is to find clinical (that is, bedside) instruction in the diagnosis and treatment of bone diseases. A careful study of the book, however, shows that the author's intention is to teach the pathology of osseous affections, as illustrated by many specimens and microscopic sections; while the diagnosis and means of relieving such diseases are to be touched upon in the most cursory manner.

Though the reader may be chagrined at not finding that which he sought, he will not be disappointed at the handling of that which he finds. Beginning with remarks on the development and anatomy of bone, which discuss the former almost to the exclusion of the latter, the author at once takes up inflammatory processes, such as osteomyelitis and periostitis; then directs attention to hypertrophy, sclerosis, tuberculous and syphilitic bone disease, necrosis and caries, rickets and mollities ossium; and, finally, concludes with a consideration of tumours of osseous tissue. The chapter on acute osteomyelitis embodies the result of much experience, for it is stated that in the author's practice in Calcutta, it was at one time rather the exception, not to have osteomyelitis subsequent to amputations and compound fractures. His treatment in such cases is similar to that recommended by Fayrer, namely, to amputate at once through or even above the joint situated between the diseased bone and the trunk. As soon as the local and general symptoms show pyæmic infection, the amputation is to be performed without being delayed an hour. He explains the fact that embolic infarctions occur in the lungs more frequently than in other organs as follows: "I believe that in pyæmia the whole of the blood in the body is charged with a deleterious agent, which, whether vital or chemical in its nature, is directly influenced by free oxygen, and meeting with an abundant supply of oxygen in the air-cells of the lungs, emboli are formed in the vessels, and necrosis of the pulmonary tissues, the so-called metastatic abscesses of septicopyæmia, result" (p. 28).

An interesting and important paragraph relates to epiphysitis, or inflammation of the structures lying between the diaphysis and epiphysis; this diseased condition of course only occurs in the young, and is usually acute in character. Its

differential diagnosis from suppurative arthritis, and its liability to give rise to fatal septicæmia, which may often be averted by free incision down to the epiphysis, invest the subject with no mean degree of surgical interest. The suggestion that "acute periostitis" so called, occurring only in the young, may be originally an epiphysitis seems to be a well-taken point.

The chapters on tuberculous disease of joints in children are especially interesting. The traumatic inflammation theory in regard to the etiology of these cases is rejected, and the affection is attributed to a scrofulous constitution. His argument is based, to a considerable extent, on the infrequency of joint-disease in the native children of Hindostan, though subject to blows and contusions as other children; this immunity is said to be due to the absence of the scrofulous diathesis in inhabitants of that country. Though agreeing with Gross in regard to the causation of coxalgia, and opposing Sayre's view, he evidently rejects the former's idea of the syphilitic origin of scrofula; he states that syphilis is widely spread in India, but that strumous diseases are rare (p. 106). As to treatment, he deprecates confinement in hospital wards during the incipient stage, and insists upon open air exercise, with such mechanical appliances as can best be adapted, even allowing some motion of the diseased joint rather than obtaining absolute rest at the expense of hygienic treatment. His commendation of Hutchison's method of treating coxalgia, as described in the *American Journal of the Medical Sciences* for January, 1879, would, in the opinion of the present writer, be unqualified.

Mr. Macnamara's experience is opposed to excision of the hip and knee for strumous arthritis: but to our mind unjustly, for the operation is certainly very satisfactory when, in poor families, the little patients cannot obtain careful nursing during the many months required for a spontaneous cure. In certain cases he has obtained good results by opening the joint, and introducing horse-hair drains through holes bored in the end of the bone (p. 125).

His confidence in Lister's antiseptic dressing in compound fractures, etc., seems to be great, but he suggests that there is danger at the present day of discredit being brought upon this method of treatment by those who seem desirous of demonstrating what amount of injury may be inflicted under the protection of antiseptic surgery without risk. For the treatment of syphilitic bone affections mercury is considered the sheet anchor, and iodide of potassium is regarded as only a palliative to be used when mercury cannot be employed. The belief expressed (p. 240) that union will occur in many cases of intracapsular fracture of the neck of the femur, if the fragments be kept at rest, is opposed to the experience and teaching of the writers of the present day. J. B. R.

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ART. XXVII.—*The Bearings of Chronic Disease of the Heart upon Pregnancy, Parturition, and Childbed, with papers on Puerperal Pleuropneumonia and Eclampsia.* By ANGUS MACDONALD, M.A., M.D., F.R.C.P.E., F.R.S.E., etc. 8vo. pp. 282. London: J. & A. Churchill, 1878.

ALTHOUGH of special interest to the practitioner of obstetrics, the subject entered upon by Dr. Macdonald in this work has much in it to attract the general practitioner, even though he may never attend a woman in labour, as a matter of choice. The question of physical eligibility for marriage, in the sense in which it is presented in this treatise, is one that should be understood and considered by every one who is called upon to treat cases of cardiac disease in female chil-

dren, young women, and older subjects, in view of the fact that marriage may be in remote or near consideration by the parents, or party more directly concerned. Unfortunately the advice given is often disregarded; but it is not always so, especially where the entire truth has been told to parents and subject. It is remarkable how some of the subjects of cardiac disease will escape the immediate fatal issue of child-bearing, and continue to live even after two or more children are born, with heart-sounds that make their living at all a marvel of existence. Organic endocardial derangements, the result of rheumatism in early life, are in many instances not incompatible with a prolonged and reasonably comfortable existence under proper care on the part of the subject; and the duration of life in two parties equally diseased will be often markedly different in either sex, according to the observance or violation of rules calculated, if kept, to preserve and prolong it. We could give some very remarkable instances in illustration, if it was necessary; but no doubt such will present themselves to the mind of the reader.

Dr. Macdonald has illustrated his work by clinical records of thirty-one cases of chronic disease of the heart, viz.: 14 of mitral stenosis; 8 of mitral insufficiency; 3 of aortic insufficiency; 3 of the same, complicated with mitral disease; and 3 of irregular cardiac lesions. He believes with Larcher, Ducrest, Zambaco, Béraud, and Blot, of Paris, whose combined and extensive observations upon women dying in childbed have appeared to establish the fact, that there is in pregnant women a moderate hypertrophy of the left ventricle of the heart, as ascertained by careful weight and measurement in several hundred subjects. He believes that the amount has been in all probability somewhat exaggerated; but that there is no doubt an appreciable growth during the pregnant state. He has not been able to determine, as claimed by Duroziez, any appreciable enlargement by the most careful percussion of the chest, but claims to have discovered, by the sphygmograph, the existence of an increased degree of arterial tension during the lying-in period; a condition which, as a general rule, is most marked at the close of gestation, and begins to diminish after parturition.

The results in the fourteen cases of mitral stenosis are as follows, viz.: Three were primiparæ, all died; four, pregnant for the second time, two died; two pregnant for the sixth time, and one died; the others were in their third, fourth, seventh, eleventh, and twelfth labours, and of these three died. In all, 9 deaths to 5 recoveries. One died during delivery; two immediately afterward; two in thirty-six hours; one in six days; one in fifteen; one in three months; and one in nine. Premature labour took place in one-half of the fourteen cases—a common termination in cases of pregnancy having mitral stenosis. Delivery does not appear, in this form of cardiac disease, to afford very marked relief to the patient, the injury inflicted by the pregnancy, in the form of dyspnoea, pulmonary apoplexy, or œdema, and congestive bronchitis, being inclined to continue.

Dr. Macdonald is an advocate of the use of chloroform in this form of heart disease, claiming that there is more danger from the bearing-down efforts of the patient than from the anæsthetic, the use of which diminishes the parturient effort, and stimulates moderately, the action of the heart becoming more regular and steady under it.

In the eight cases of mitral insufficiency reported, there were four deaths. No. 1 was but slightly affected, and after five easy labours in nine years was in as good health as when married. No. 2 escaped in three labours. No. 3 was taken in labour when affected with phthisis, and died of it in eleven days. No. 4, labour at seventh month, died in three days. No. 5, second pregnancy, labour at term, died of pulmonary œdema and exhaustion in twenty-three days. No. 6, labour at term, recovered, primipara. No. 7, an elderly primipara (38), embo-

lism in ninth month, recovered. No. 8, under observation in three pregnancies, died in ten days after third. In but one case was the labour premature, showing quite a contrast with the effect under mitral stenosis, in which it reached fifty per cent.

In the third class, viz., aortic insufficiency, there are six cases recorded, with three deaths. No. 1, primipara of 23, had rheumatic fever at 15; suffered since with shortness of breathing on exertion; in labour at full term; pulse very irregular; disposition to faint; chloroform administered with safety; forceps delivery; mother and child did well; serious symptoms subsiding as soon as the uterus was empty. No. 2, also a primipara, 24; rheumatic fever three years before; aortic insufficiency complicated with mitral obstruction; frequent hæmoptysis, with cough, dyspnœa, and vomiting; labour at eighth month; terminated favourably; died in three weeks of pulmonary œdema and congestion; mitral opening size of little finger; aortic valves very defective. No. 3, primipara, 26; same conditions, originating in rheumatic fever five years before; pain, palpitation, cough, hæmoptysis, vomiting, nephritis, convulsions. Labour induced, and a seven months' fœtus, some time dead, turned and delivered. Woman died in three hours. No. 4, third labour, 40; severe aortic insufficiency, the result of acute rheumatism two years before; premature labour at end of seventh month; died in three weeks; lungs engorged and œdematous; heart weighed  $15\frac{1}{2}$  ounces. No. 5, primipara, 34; violent præcordial pain, dyspnœa, lips cyanosed; slight œdema of feet; labour in thirty-fourth week, with rapid removal of grave symptoms. No. 6, slight case, primipara of 19; premature labour in eighth month; recovery.

The author explains the beneficial result of delivery as follows: "It is greatly due to the fact that the down-bearing pains are unquestionably associated with a very greatly intensified aortic pressure, and that this tension acts during the second stage of labour with a threatening effect; but so soon as the uterus is emptied, the original pressure is restored, and thus a calm of the disturbance is the result." (p. 166.)

The cases classified by the author as *irregular*, three in number, were all of a complex character, and all terminated fatally. The whole list of 31 cases shows a mortality of 55 per cent. The following valuable deductions of Dr. Macdonald give the teachings of the record of cases in short compass:—

"1. Chronic heart disease ought to be looked upon as a grave contra-indication of marriage, more especially if it assumes the form of anything approaching to severe stenosis of the mitral, or to serious aortic incompetency; in such cases we ought, if consulted, to dissuade from marriage.

"2. There is less danger in the case of mitral insufficiency; but still the risk is even then considerable.

"3. In all cases, when consulted, we ought not to give our sanction to marriage if, in connection with chronic heart disease, there are any symptoms of cardiac disturbance present, such as attacks of dyspnœa, breathlessness, palpitation on exertion, hæmoptysis, etc.; and this injunction ought to be the more imperative the younger the patient, and the more recent the acute disorder that has given rise to the chronic lesion.

"4. Such patients as are married and have chronic heart disease ought not to be allowed to suckle their children, as that appears to tend to keep up the cardiac hypertrophy, and increase the risks likely to arise from the defective heart.

"5. All possible causes likely to produce inflammatory action in the lungs, and all severe exertion, should, if possible, be avoided during the pregnancy, and more particularly during the latter months of it.

"6. Premature labour should seldom or never be recommended, because it is so much more likely to do greater harm by disturbing the action of the heart, and the condition of the lungs, than any good it might produce by terminating



the evil effects of the pregnancy. It is always to be remembered that relief of symptoms is not certain after delivery, or indeed anything like certain.

"7. The only conditions which seem to warrant the induction of premature labour are the presence of influences which unduly distend the abdomen, and thus keep the diaphragm in a state of continuous elevation.

"8. The same general principles of management ought to guide us in the case of a patient with chronic heart disease during pregnancy and the lying-in period, as are followed by us in dealing with patients who suffer from heart disease apart from pregnancy.

"9. In almost all the cases I have met with chloroform has been given, and apparently with benefit, during delivery. If carefully administered, I think it cannot but be useful in all cases.

"10. All legitimate means ought to be used to lessen the effects of the down-bearing efforts, and therefore the judicious and timely application of forceps, or in suitable cases the performance of version, is extremely important if the second stage of labour happens to be in any way prolonged. In case of a large amount of liquor amnii, timely rupture of the membranes is calculated to be of great service, as it allows the diaphragm to descend, and thus lessens the embarrassment in the lesser circulation.

"11. Increased experience warrants me in believing that the mortality following pregnancy, complicated by chronic disease of the heart, may be greatly lessened by due precautions during pregnancy and delivery, especially during the latter." (p. 207.)

The balance of the work, 72 pages, is made up of two valuable monographs upon Puerperal Pleuro-pneumonia, and Eclampsia, with a clinical record of two cases of the former, and one of the latter. As the author is a very critical expert in cardiac lesions, his work will be found of most interest to the student of this class of diseases, the cases being given, in many instances, very minutely. In the section on vascular tension in pregnancy as evidence of cardiac enlargement, will be found numerous sphygmographic tracings taken from typical subjects. We can very cordially recommend the work as an important addition to our treatises on diseases of the heart.

R. P. H.

ART. XXVIII.—*An Essay on the Pathology of the Œsophagus.* By JOHN F. KNOTT. Pp. 225. Dublin: Fannin & Co., 1878.

THIS volume is the successful result of an essay to obtain the prize of the Dublin Pathological Society. In its preface the reader is informed that the author is a medical student, in his third winter of hospital attendance, and, consequently, his effort must largely represent a compilation. Most comprehensive works should be compilations, in addition to whatever else may be included, and in the manner of compiling the merits of the writer are often best shown. The rarity of recent works on diseases of the Œsophagus is sufficiently evident to all physicians, and the amount of research necessary for the comparative study of cases, with the exception of those relating to the more common lesions, often renders such study of but little persistence. A bibliographical index alone would, therefore, be warmly welcomed, and an index which gives something else than titles merely, becomes the more valuable in proportion.

This essay is considerably more than an index, and appears at a time when the study of Œsophageal disease is receiving a fresh impetus from the appearance of late years of separate papers in foreign and domestic medical journals; and from the recent publication by Zenker and Von Ziemssen of the monograph in the *Cyclopædia* edited by the latter.

Its table of contents included a chapter on the anatomy and physiology of the gullet, followed by others treating of irregularities in development, of dilatation, inflammation, solutions of continuity (including perforation, rupture, wounds, injuries from acids and alkalies, and digestive solutions), of nervous lesion, as paralysis and spasm, of morbid growths and foreign bodies, with concluding chapters on syphilitic affections and dysphagia. Such a classification is partly anatomical, in part etiological, and partly symptomatic; in the absence of a final index, however, it is, perhaps, all the more convenient for being thus mixed.

In the relation of the single chapters to each other, a more logical sequence might have been attained had the sections on œsophageal wounds and foreign bodies more closely followed those on perforation and rupture. It might also have been more convenient to have established a separate chapter on stenosis or stricture, under which heading a portion of the chapter on syphilitic lesions would readily have fallen; while syphilitic ulcerations, as representing a specific form of inflammation or of neoplasm, might naturally be looked for in connection with these subjects. The comparative novelty of this form of disease, however, may be held a sufficient reason for giving it special consideration. In treating separately of dysphagia, more or less repetition becomes necessary. As this symptom of œsophageal disease is not only the most important, but also the most frequent, there can be no question of the convenience of including under this head a consideration of the various lesions which may produce the effect, their more detailed consideration being readily sought for elsewhere.

In speaking of the diameter of the normal œsophagus, attention might have been called to the effect produced by the tracheal bifurcation, in diminishing the calibre of the gullet. Although the smallest diameter is to be found at the level of the cricoid cartilage, the impaction of foreign bodies lower down, and the well-known frequency of tumours in the region referred to, indicate that the functional diameter of the tube does not progressively increase till the diaphragmatic opening is reached.

One effect of the incomplete development of the œsophagus is not noticed, and as it plays so important a part in the cause of death of the infant, it should occupy a prominent place in the consideration of the several malformations. The effect is consequent upon attempts at feeding. All food is not simply regurgitated by the sufferer, but a portion often enters the lungs, and a pneumonia follows, which may involve the greater part of both lungs. This event becomes all the more inevitable when food or stimulants are injected into the pharynx, or when the infant's nostrils are closed that it may be urged to open its mouth for the reception of fluids.

Mention is omitted of a very frequent form of œsophageal dilatation, that resulting from traction, which may even become of serious importance as the seat of ulceration or perforation. Such traction is usually dependent upon chronic inflammatory processes, with consequent contraction of the tissues lying outside the œsophagus, especially at the tracheal bifurcation, and which evidently bear an intimate relation to changes taking place in the bronchial glands.

Objection may be made to the including of aphthous patches under the results of croupous inflammation. The two conditions are so distinct anatomically and clinically that such a confounding is more than an oversight. This confusion is frequently met with in the description of cases, owing to the appearance of broad, and often long, whitish patches of false membrane, but the morphological distinction between the vegetable growth and the coagulated fibrine is very readily made out.

The author calls attention to a form of perforating ulcer of obscure origin, but quite distinct from ulcerations elsewhere found in the digestive canal. The exist

ence of such an idiopathic ulceration is based upon the reports of a limited number of cases, which do not furnish satisfactory evidence of the view presented. The recognized causes of ulceration and perforation are sufficiently numerous to explain the origin of most of the ulcers; errors of observation are frequent, many examiners are incompetent, and very strong evidence, much more convincing than appears in the cases reported, must needs be presented before an idiopathic form of perforating ulcer can be admitted among the well-known varieties.

In thus pointing out some of the peculiarities of this volume, attention should again be called to the unusual circumstances of its origin. Its faults are those almost necessarily connected with the period of development attained by the writer, a medical student. At such a stage authority occupies so prominent a position that recorded cases are used as if they were satisfactory evidence, and a great deal is omitted which time, opportunity, and, perhaps, training might have permitted a place. As the work of a medical student, the book presents unusual merit, and compares very favourably with works of a similar character prepared by men of fuller maturity. The writer shows zeal, industry, and considerable discrimination, and his task has been accomplished with much care and taste.

R. H. F.

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ART. XXIX.—*The Pathological Anatomy of the Ear*. By HERMANN SCHWARTZ, M.D., Professor in the University of Halle on the Saale. With the author's revisions and additions, and with the original illustrations. Translated by J. ORNE GREEN, A.M., M.D., Aural Surgeon, Boston City Hospital; Clinical Instructor in Otology in Harvard University. 8vo. pp. 174. Boston: Houghton, Osgood & Co., 1878.

THIS is a most excellent scientific work, and the subject is so divided as to make the book a very easy one to read and understand. A typically normal ear is rarely found on dissection, for, as we are informed, in most cases abnormal conditions of congestion and secretion are discovered, especially in the middle ear. These are to be regarded either as occurring at the time of death or *post mortem*.

The diseases most frequently affecting the ear are the acute exanthemata, typhus and typhoid fever, acute and chronic catarrh of the nose and naso-pharynx and their results, tuberculosis, diseases of the heart, syphilis, puerperal fever, and chronic alcoholism.

When treating of *caries* and *necrosis* of the temporal bone it is stated that these processes attack the temporal more frequently than any other cranial bone, the points of preference being the mastoid portion: less frequently the petrous part, and least frequently the internal meatus or the porus acusticus internus. Necrosis of this bone is less common than caries. The pages 12-19, which contain the author's digest of necrosis and caries of the temporal bone, with a short sketch of the ravages of abscess of the brain, should be carefully studied by every practitioner of medicine. On page 14 the author but reiterates the statement of the deplorable fact that caries of the temporal bone is generally the secondary result of an acute or chronic suppuration of the soft tissues of the ear, which has extended to the surrounding bone; seldom is it the result of suppurative otitis or primary periostitis, and on page 17 he states that the relation between caries of the temporal bone and abscess of the brain, is that the former is the primary lesion and the latter the secondary lesion, thus forming a most direful sequence between a too often neglected ear-ache, and a surely fatal disease.

Of course it must be admitted, as is stated by the author, "that abscess of the brain and disease of the ear may occur simultaneously from the same cause, trauma, as has been shown by Albers."

In this connection it will be well to bear in mind that which is recalled by the statements of Professor Schwartz, that abscess of the brain may be unsuspected, and also that in two instances, once by Von Trœltzsch, and once by Magnus, an abscess of the brain has been found on the side opposite to the affected ear. To explain this peculiarity, metastasis, tuberculosis of the lung (by infecting the brain from a gangrenous cavity), and an accidental coincidence have been urged. The rule is, however, that but too plainly the aural disease has produced the cerebral abscess: even the doubtful cases are extremely rare. Sometimes, as our author states, instead of an abscess, a tumour of the brain is found in connection with chronic otitis. In referring to *fracture of the base of the skull* and the implication of the ear therewith, it is stated that in some instances "brain substance may be forced through the meatus externus." "Inflammation of the brain and its meninges, dependent upon fracture of the petrous bones, may not ensue until several weeks after the injury." This is an important point to remember.

Under *malignant tumours* of the temporal bone, which as primary occurrences are rare, primary epithelial cancer is alluded to, three cases of which the author has observed. In all of these observed by Dr. Schwartz the origin of the growth was the tympanic mucous membrane.

The *external auditory canal* is next considered, and an important physiological fact is presented, viz.:—

"In childhood, up to the fourth year, an ossification gap, closed merely by connective tissue, is found normally in the anterior lower wall, to which Von Trœltzsch first directed attention. The knowledge of this fact is of importance to avoid mistaking it for a carious opening. In adults, remains of this opening are met with in exceptional cases. During purulent inflammations of the middle ear, ulcerative destruction of the skin over this spot of deficient ossification may occur, and through the opening an extension of the inflammatory process of the meatus may reach the parotid gland and the lower jaw."

The author reminds us of another important fact, viz.: the common name, "catarrh of the external meatus has no anatomical justification." Since catarrh can exist only where there is mucous membrane, and as in the external auditory canal there is no mucous membrane, there can be no true catarrh. Profuse supuration of this canal, we are told, is unfavourable to the growth of fungi; hence otomycosis is most usually found in an ear which has been, but is no longer, the seat of active inflammation. An eczema of the auditory canal may extend over the membrana tympani. "A not infrequent complication of eczema of the meatus is mucous catarrh of the middle ear, without perforation of the membrana tympani." Regarding furuncle of the auditory canal our author states that its most common seat is the anterior lower wall of the meatus. This, the circumscribed inflammation of the skin of the canal, is a very trivial matter when compared to *diffuse* inflammation of the skin of this part of the ear.

The latter may extend from the cutis and involve the subcutaneous cellular tissue, and "if not relieved by *early* and *deep* incisions the inflammation may go on, to gangrene, extensive destruction, disease of the bone, or even to purulent thrombosis of the sinuses and to septicæmia."

Foreign bodies in the form of masses of sebum, epithelium, etc., in this canal may, besides the secondary inflammation of the skin, produce atrophy or ulceration of the membrana tympani from pressure. More commonly, by forcing the drum-head inwards, they favour adhesion between the membrana tympani and the inner wall of the tympanum. They may also greatly enlarge the calibre of the

canal. In one instance Von Træltseh observed fatal facial erysipelas result from the irritation set up by one of these masses in the ear.

On page 53, Cholesteatomata of the meatus are alluded to. It is known that Toynbee described large numbers of these collections in the meatus, as sebaceous tumours. He ascribed to his "sebaceous tumours" an enveloping membrane of connective tissue, which has its origin on the floor of the meatus, near the drum-head. His description, therefore, of "sebaceous tumours" closely corresponds with that now given of cholesteatoma. It may be that these collections do originate in the canal from true sebaceous tumours or wens. These by breaking down would produce a condition of the meatus analogous to that found in the so-called cholesteatoma. But the latter term only describes the resultant appearances, not the cause. A wen in the auditory canal is exactly like a wen in any other part of the skin covering a cranial bone, and it is well known that a wen over the calvarium will erode the bone, and finally grow upon the dura mater,<sup>1</sup> or by finally breaking down produce results similar to the so-called sebaceous tumours of the meatus. Judging by analogy it would seem highly probable that so-called cholesteatoma of the canal is in reality nothing more than a broken-down wen. In referring to injuries of the meatus, it is stated "that limited fractures, which do not extend to the base of the skull, sometimes occur in the extremely thin upper wall of the meatus from contusion of the head. This may produce injury of the brain and evacuation of the brain substance from the ear without death necessarily resulting."

The author is not accurate in his statement that he was the first to call attention to the growth of vegetable parasites in the human ear: his first paper, as is stated on p. 55, of the work before us, was published in 1865. But Mayer<sup>2</sup> and Pacini,<sup>3</sup> both preceded him in describing the growth of fungi in the human ear.

The author makes the interesting statement that a constant hyperæmia of the manubrial vessels of the membrana tympani is a sign either of "inflammatory irritation in the drum-membrane or tympanic cavity or else a symptom of habitual congestion of the head."

Perforations of the membrana tympani are said to be most common in the anterior lower quadrant of the membrane in the intermediary zone between the manubrium and the tendinous tympanic ring. The largest and most rapid destructions of the membrane occur in scrofula, tuberculosis, and especially in scarlatina. Prof. Schwartz considers duplicate perforations of the membrana tympani common, while Prof. Politzer holds an opposite opinion. Our author presents no statistics for his opinion, which, in view of the rather exceptional position taken by him, would seem desirable.

So far as our experience goes, multiple perforations of the drum-head are rare in this country, and by no means common in Germany. The cribriform condition of the membrane alluded to by the author is entirely unknown in our experience, but Prof. Schwartz now inclines to the view, first advanced by Bonnafont, that "not only in tuberculosis pulmonum and in miliary tuberculosis, but also in scarlatina, with pharyngeal diphtheritis and pyæmic conditions, the membrana tympani may be simultaneously perforated at different points. These multiple perforations are at first very minute, but rapidly enlarge, and finally coalesce into a large opening, perhaps from emboli." On this subject the author quotes C. E. E. Hoffmann,<sup>4</sup> "When considering the membrana flaccida or Shrapnell's mem-

<sup>1</sup> Camille Misset. *Etude sur la Pathologie des Glandes sébacées*. Paris, 1872.

<sup>2</sup> Muller's *Archiv*, p. 401, 1844.

<sup>3</sup> "Supra una Muffa parasita (Mucedo) nei condotto auditivo esterno." Florence, 1851.

<sup>4</sup> *Archiv f. Ohrenheilkunde*, IV. S. 277.

brane, i. e., the part of the membrana tympani above the folds, the author disappoints us, in slighting, as it appears to us, the pathological conditions often found in this part of the ear. They are not only grave as to the injury to hearing, which they produce, but they are difficult to cure. The perforations in this part of the drum-head are generally, if not always, the sign of deep-seated disease in the upper part of the tympanic cavity. Otological writers in this country have contributed largely to this subject.

The *Tympanum* commands our attention as that part of the ear most "frequently involved in pathological processes."

The three forms of catarrhal inflammation affecting the middle ear are the *serous*, the *mucous*, and the *purulent*. While these forms clearly defined may and do occur, the author thinks the transition forms are more common. "The very highest degrees of catarrhal swelling of the tympanic mucous membrane are capable of complete retrogression, the membrane resuming its cobweb-like delicacy, and moulding itself accurately to the osseous walls and contents of the tympanic cavity." It is of the highest importance to note that there is also a *croupous* and *diphtheritic* inflammation of the tympanum, unknown until described by Wendt.

Of *new growths* in the tympanum, polypi are common, appearing usually as fibromata and as myxomata: rarer forms are fibroma and gumma of the chorda tympani. Angioma has been found in the ear by Dr. A. H. Buck, of New York. Other new growths in this cavity are named, as, exostosis, hyperostosis, cysts, epithelial cancer, osteosarcoma, and tubercle. The author reminds us that the *Eustachian tube* has a very narrow, slit-like mouth in children. This fact shows how easily this part of the tube partakes in swelling of the pharyngeal mucous membrane in childhood, and why it is that the tube becomes so easily closed in the young. The author denies the existence of the so-called valve of the tube, heretofore described as a normal condition. The valve-like duplicature of the mucous membrane "is pathological, and due to a relaxation or wrinkled swelling of the mucous membrane." On p. 135 a caution is given, respecting the Eustachian tube, in the statement "that traumatic inflammations of the Eustachian tube sometimes occur after surgical operations in the naso-pharynx, and from incisions into the tubal orifice during *resection of the upper jaw*, etc."

Ulceration of the pharyngeal mouth of the tube occurs in syphilis: ulcerations here and on other parts of the naso-pharynx "can often be recognized by a rhinoscopic examination, where the usual inspection of the pharynx, without a mirror, would raise no suspicion that an ulcerative process existed." According to Rüdinger, the tube is liable to abnormal gaping throughout its entire length with atrophy of the musculus dilatator tubæ in *old persons*. Cicatricial closure of this tube, at its pharyngeal end, has been observed after diphtheria, variola, and scrofula. New growths appear in this tube in the form of polypi and polypoid tumours, syphilitic excrescences, caseous nodules in miliary tuberculosis, and exostosis in the osseous part.

Complete absence of the *mastoid portion* is found with other malformations in the temporal bone in congenital deaf-muteness. It is said that in 600 skulls examined by Hyrtl, the occiput entered into the formation of the mastoid cells in three cases. Catarrhal inflammation of the pneumatic cells of the mastoid bone may exist as an independent affection without extending to the tympanum, and without perforation of the membrana tympani. Dr. Zaufal's case is alluded to, in which an isolated suppuration in the mastoid cells took place without caries and without extending to the tympanum, but led to phlebitis of the sinuses and death.

Periostitis externa, and caries and necrosis are next considered, together with

eburnation or sclerosis; the latter is termed a common result of chronic inflammations of the middle ear, especially of the purulent variety. *New growths* in the mastoid portion are of various kinds; prominent among them are lymphomatous tumours, concretions of a chalky consistency in the mastoid cells from syphilis, polypi, cholesteatoma; and *primary epithelial cancer*.

The diseases of the *inner ear* and auditory nerve are considered under malformations, anæmia, hyperæmia, hemorrhage, inflammation and its results, caries and necrosis, new growths and injuries. There is also an extremely interesting and valuable contribution to the diseases of the auditory nerve, between its central origin and its entrance into the labyrinth.

The entire labyrinth may be wanting or imperfectly developed. "A congenital absence of the auditory nerve is extremely rare, and is never found except with absence of the labyrinth." Anæmia of the labyrinth, not easily diagnosed, has been assumed to be the cause of disturbances of function of the ear, following depleting diseases. It is said to result also from contraction and embolus of the *arteria auditiva interna*, and also from aneurism of the basilar and carotid arteries.

Hyperæmia of the labyrinth is given as "the result of disturbances in the vasomotor innervation in hysterical persons."

In regard to the so-called Menière's disease, and the very hypothetical primary inflammation adduced by Menière to account for the case given by him, and on which an absurd and incorrect nomenclature has been established and widely circulated, "it is doubtful whether it was anything more than a simple hemorrhage."

It will not be out of place to say that aural vertigo should be the general term for all cases of vertigo arising from aural irritation. Menière's disease, if it means anything, means disease of the semicircular canals, according to Menière himself; and yet this name is applied loosely to the vertiginous symptoms which may arise from irritation in the ear, anywhere from the meatus to the auditory nerve.

It is well known that the labyrinth cavity has been found filled with pus in cerebro-spinal meningitis, but this is emphatically a secondary process, a neuritis descendens, from the meninges to the labyrinth.

Caries and necrosis of the labyrinth are next considered, and some very interesting cases of detachment of the cochlea referred to, one of which, that of Niemetschek, of Prague, records the expulsion of the necrotic labyrinth through the nose.

The "diseases of the auditory nerve" is a most carefully prepared digest of the data on these points, enriched by the author's experience in several matters of obscurity and rarity, as, for example, the result produced in the ultimate fibres of the auditory nerve by tumours on its trunk, and amyloid degeneration of the nerve, the effects on it produced by gummata of the brain or base of the skull, basilar meningitis, aneurism of the *arteria basilaris*, hydrocephalus internus, and other intracranial processes.

It is with unfeigned pleasure we have read this book, and with a similar feeling we congratulate the author on his admirable work, and the profession on the acquirement of such a book for guidance in pathology. The author has been very fortunate in his translator, and to Dr. Green readers of English owe a debt of thanks not easily discharged.

C. H. B.

ART. XXX.—*The Surgery of the Face*. By FRANCIS MASON, F.R.C.S., Surgeon and Lecturer on Anatomy at St. Thomas's Hospital. 8vo. pp. 170. London: J. & A. Churchill, 1878.

THIS volume is made up of the three Lettsomian Lectures of 1877-78, before the Medical Society of London. They were originally printed in the *Lancet*, and are now gathered into a book of most readable type, and with one hundred illustrations. Having been thus already before the profession, the lectures will require less notice than if they were now first published.

If Mr. Heath can make a most readable and instructive book of large size on the jaws alone, it would seem to be folly to attempt to compress into three lectures the surgery of the whole face. Yet this is the vain endeavour of Mr. Mason. The lectures embrace respectively the diseases, the injuries, and the deformities of the face, and about *fifty* topics are treated, or rather touched upon. Many, if not most of them, are so briefly noticed, that it would have been better had they been entirely omitted, and the space and time so gained given to a more thorough discussion of the remaining subjects.

Yet the book is a good one, especially for two reasons. Mr. Mason has been exceedingly industrious in collecting and correlating very many detached cases (though chiefly English cases), which bear on his subject, to which he has added no inconsiderable number of his own, and has thus furnished the surgeon with much material for the study of the subject; and he has grouped, compared, and contrasted the various methods of operating for nævi, hare-lip, cleft palate, deficient lips, nose, etc. Moreover, these are all admirably and fully illustrated as well as described. To avoid scars on the face, a matter of no small moment, he urges that the *rubber* adhesive plaster be used where sutures can be avoided, or if they cannot be avoided, that they be of fine silk. The reviewer has, for some time, used the Japanese bead silk, a very fine but quite strong silk, and with great satisfaction. The plan recently proposed by Dr. Packard, of very oblique instead of perpendicular incisions, would find in the face one of its happiest applications. Should the book reach a second edition, we trust that the author will allude to this, and also to the use of the dental engine in operations on the nose, jaws, etc., a matter now attracting considerable attention.

The style of the book is, in general, excellent, and singularly free from the petty errors most authors are apt to commit occasionally; but even the ever-convenient "noun of multitude" will hardly excuse such an expression as "the Fellows may try it on *their own person*" (p. 89). W. W. K.

ART. XXXI.—*Zur Behandlung einfacher Fracturen der Extremitäten mit Gyps-Hanf-Schienen*. Von Dr. F. BEELY. 8vo. pp. 75. Königsberg, 1878.

*The Treatment of Simple Fractures of the Extremities by Splints of Hemp and Plaster of Paris*. By Dr. F. BEELY.

THE author of this monograph believes that narrow splints, made of strands of hemp fixed by plaster, are an improvement over the ordinary plaster of Paris dressing applied in a circular manner. He discusses first the manner in which fracture dressings act, and the diagnosis of fractures; in which section he very properly deprecates violent and persistent efforts to obtain crepitus, because the manipulation is apt to tear any bands of periosteum which may be holding the fragments



together. After some further general remarks he specifies the components of the hemp and plaster dressing, and then lays down the rules for its application and removal, and for the after-treatment of the case. Finally the form and manner in which he applies the splints for each special fracture are fully detailed, and illustrated by numerous demonstrative lithographic plates.

The gist of the thing is simply this. After the fragments have been placed in apposition, and the member put in the proper attitude, long strands or bundles of hemp, as thick as the little finger, one and a half or two feet long, and saturated with wet plaster, are laid upon the limb longitudinally, and allowed to dry. By this means splints accurately fitting the contour, and in width about one-third the circumference of the limb, are expeditiously manufactured. If hemp is not convenient, tow or flax can be used with the same result. Of course woven fabrics, as has been demonstrated by others, make equally good splints. After the super-imposed layers of hemp and plaster become dry and hardened, an ordinary retentive roller is applied.

We have, as is seen, in this dressing a splint accurately moulded to the part, and acting as the felt splints, used in this country, which are adapted to the contour of the limb by being softened with hot water. In the hemp and plaster dressing wire loops can be fastened at various points, if it is desirable to suspend the broken limb, by fixing the ends of the wire between the layers of hemp. Continuous weight extension can be used at the same time by means of adhesive strips and the ordinary pulley.

The method of dressing fractures here described was employed in 313 cases under the personal supervision of the author, who therefore believes his opinion as to its merits to be founded on sufficient experience to render it worthy of acceptance. The use of the plaster dressing applied circularly is more common in Germany than in America, and as a consequence our author compares his modified plaster dressing solely with that, paying little or no attention to the claims of wooden, felt, or card-board splints. The author's aim is to establish its superiority to the circular plaster dressing, which the reviewer is willing to admit in many instances, though he does not consider the plaster splints as cleanly or as readily adjusted as some other appliances.

It is claimed that these splints are cheap; that the materials are easily obtained of good quality and in large quantity; that no cotton padding is required because they fit the limb so accurately; that the dressing can be applied tightly or loosely without being removed; that inspection of the injured extremity is permitted, and that removal of the dressing is effected easily and rapidly. Most of these advantages are presented to meet the objections of those favouring the circular dressing, and hence few of them apply to splints of moulded felt or cardboard, which allow equally well inspection of the injury, ease of adjustment, and rapid removal. Very minute directions are given (pp. 12-20) regarding the selection of materials and the treatment after the splints have been applied, which will suggest themselves at once to any practical surgeon.

In fractures of the humerus and forearm Dr. Beely applies the splint on the outer and dorsal aspect of the limb, and at times introduces a wire loop at the wrist for the attachment of the sling passed around the neck. For fracture of the tibia or femur an anterior splint with numerous rings for suspension is employed; sometimes permanent extension is combined with this dressing, giving much the same effect as the wire splint devised by Hodgen of St. Louis. When deemed proper the fractured limb can be treated by the postural method, and the desired position retained by moulding suitable splints. Again, pelvic bands or shoulder caps can be made, when the line of fracture is near a joint, in order to render the dressing firmer. It is also easy and, it would seem, very judicious to

employ this dressing in resections of joints by constructing bracketed splints from stout iron hoops fixed in the layers of hemp.

From the description given it will doubtless be admitted, that if any form of plaster dressing is to be employed in the early stages of fractures, whilst frequent inspection and changes in the firmness of the pressure are necessary, the modification of our author is a decided improvement; but the time requisite to apply the splints properly, the inconvenience attending the mixing of the plaster, and its subsequent chipping and breaking render other forms of splints preferable in the majority of instances.

J. B. R.

ART. XXXII.—*Lectures on Bright's Disease of the Kidneys, delivered at the School of Medicine of Paris.* By J. M. CHARCOT, Professor of the Faculty of Medicine of Paris, Physician to the Salpêtrière, etc. etc. Collected and published by Drs. BOURNEVILLE and SEVESTRE, Editors of the *Progrès Medical*, and translated, with the permission of the author, by HENRY B. MILLARD, M.D., A.M. 8vo. pp. 100. New York: William Wood & Co., 1878.

THE translator of this excellent little monograph was led, as he intimates, to undertake his work by the feeling that there is no other book upon the subject which gives, "with so much clearness and well-chiselled outlines (*sic*), the salient and practical features of the disease." The conviction which Dr. Millard thus labors to express will, we think, be shared by most of his readers, and if the volume before us had been so extended as to include the therapeutics of Bright's disease, it would probably have proved a formidable rival, for professional favor, to the larger and, in this respect, more complete treatises of Dickinson and Grainger Stewart. Even in its present form the brochure is valuable enough to be well worth the study of every busy practitioner who has a new case of albuminuria to manage, and it will of course find a place upon the library shelves of every one who aims to keep himself *au courant* with the literature of the day in regard to maladies of the urinary organs.

The classification of Bright's disease adopted by Prof. Charcot is substantially that with which most are familiar through the writings of Grainger Stewart (who by the way credits Virchow with first suggesting it), namely, the histological one into, first, parenchymatous nephritis, or disease of the epithelium lining the tubules; second, interstitial nephritis, or inflammation of the intertubular connective tissue; and third, amyloid degeneration, or infiltration with the so-called amyloid or lardaceous material. To the description of these three forms, preceded by two admirable chapters on the normal structure and functions of the kidneys, the volume is mainly devoted.

The anatomy and histology of the organ are very fully and distinctly explained, not only in the text but by the aid of several wood-cuts, which illustrate the arrangement of the tubuli contorti, the loops of Henle, and the tubes of Bellini, with unusual clearness. Our author follows Heidenhain, in describing the epithelium of the convoluted tubules, as being filled with rod-shaped striæ, converging like radii toward the centre of the tube; these, when examined in a line with their axes, presenting the appearance of granules, and giving rise to the cloudy aspect so generally observed. The histological account is full and accurate (as far as our present knowledge extends) to a remarkable degree, requiring but little preliminary knowledge to render it available even to medical students. The relative narrowness of the loops of Henle, in their ascending limbs, as compared with the calibre of the tubuli contorti, is specially emphasized, and its important

practical deduction, in regard to the diagnostic value of some kinds of tube casts in the urine, pointed out in the following terms:—

“In a general way, the clinical importance of urinary casts has been greatly exaggerated. They are not, as they have been called, ‘faithful messengers,’ announcing to the clinical observer the anatomical condition of the kidneys,’ or ‘mirrors reflecting the various renal lesions.’ Formed in the ultimate parts of the apparatus of the tubuli uriniferi, they can only in any case furnish information upon the condition of these parts. I have previously maintained the fact, that the casts formed in the convoluted tubes can but very seldom pass into the urine.”

In regard to hyaline casts, M. Charcot correctly states that they may even be found in the urine during health, and are quite common in cases of jaundice, when they seem to be the result of some action of the bile acids upon (or in) the blood, as Leyden has demonstrated their occurrence in animals whose veins had been injected with biliary acids. They are also met with, as is well known, in diphtheria, and certain acute febrile affections, and, on the other hand, may occasionally though rarely be entirely absent during the course of true Bright’s disease.

Under the head of physiological action of the kidneys is given the best exposition which we have yet seen in English, of Heidenhain’s very ingenious experiments for proving that the watery portion of the urine is secreted by the glomeruli, whilst the saline ingredients are eliminated by the epithelium of the tubuli uriniferi.

Probably the nearest approach to a real *raison d’être* for the translation, however, is to be found in the systematic effort made by Prof. Charcot, to link together the clinical history, the microscopical and chemical characters of the urine, and the pathological histology of the kidneys, in each of the different forms of Bright’s disease. The knowledge which the methods pointed out in this portion of the volume will afford, respecting difficult examples of renal malady, must often, we think, prove invaluable to practitioners of medicine anxious to avail themselves of every ray of light which can by any possibility contribute to illumine obscure cases of these affections among patients entrusted to their care. Thus, for instance, our author tells us that in fully-developed interstitial nephritis, the quantity of urine is generally increased above the normal average, instead of being diminished, as in parenchymatous nephritis. In the former of these affections, hypertrophy of the left ventricle without valvular lesion, is rarely absent, whilst in the latter it seldom occurs. On the other hand, dropsy is unusual in interstitial, and common in the parenchymatous form of the complaint. The amount of albumen in the former is very small, and that of urea nearly normal in interstitial nephritis; yet in it uræmic accidents, such as habitual dyspepsia, persistent headache, uræmic amaurosis, and, in its stage of fullest development, paralysis agitans, epileptic and even apoplectic symptoms appear; whilst none of these phenomena are, as a rule, met with in the parenchymatous variety of morbus Brightii.

From the abstracts already given, it will be seen that we deem this work of Prof. Charcot clear, concise, and yet complete, within its somewhat limited scope; the great fault being, as already stated, an entire absence of any account of the treatment suited to the various forms of Bright’s disease. This, if associated with the lesions, signs and symptoms as carefully and skilfully as the latter have been grouped together by our learned author, could scarcely fail to have made the work a necessary one to almost every practitioner of medicine; and we trust that the next edition will appear enriched with at least one more lecture devoted to the therapeutics of the disorder under consideration.

Among the minor omissions, we regret to find that no mention is made of Klebs' discovery, that in certain inflammatory and often actually diphtheritic processes in the bladder, vegetable organisms wander up the ureters and renal pelves into the urinary tubules. Here the plugs of micrococcus spores, which are readily recognized after death, set up a form of nephritis, which frequently proves fatal, and must certainly be recognized as one of the varieties of Bright's disease.

The duties of the translator have been generally well performed, but we are sorry to notice evidences of haste and carelessness, which occasionally rise to the magnitude of actual blemishes upon the work. Thus, for example, we are surprised to observe Dr. Millard stating, on p. 37, that the urine of interstitial nephritis is of "feeble" (not robust) "specific gravity;" and profoundly astonished to see the title of M. Cornil's essay before the Concours, presented when applying for the position of *Professeur Agrégé*, translated on p. 31 by the words "Thesis on aggregation"!!

The paper, type, and press-work, are creditable to the publishers, and two excellent chromo-lithographs greatly add both to the appearance and the usefulness of the book.

J. G. R.

ART. XXXIII.—*An Atlas of Human Anatomy. Part I., 4 plates, 4to. With an Explanatory Text.* By R. J. GODLEE, F.R.C.S. 8vo. pp. 56. Philadelphia: Lindsay & Blakiston, 1878.

THIS is an exceptional work in one respect, viz., the author is both the anatomist and the artist; a combination of talent rarely seen in our profession since the time of Sir Charles Bell. He is to be greatly envied for the ability he has shown, and to be congratulated on the success he has achieved in both departments. It is also a guarantee for the fidelity of the plates—a guarantee which is confirmed by their careful inspection. We do not know anything as to the author's ability to teach the students of University College, but if we may judge from the present work, he ought to be one of the best of anatomical teachers, for in few departments are clear and quickly-drawn blackboard sketches of such rare value as in Anatomy. The more elaborate and minute a picture is the less is it adapted for teaching purposes. It will answer admirably for careful study, but a bold, and, it may be, even rudely drawn outline sketch, which the student can watch as it grows rapidly on the blackboard under his eye, is the one from which he will carry away the most lasting impressions. In such sketches Mr. Godlee ought to be a master.

The work will consist of about 52 quarto plates, issued in parts, with an octavo volume of some 300 to 400 pages. The plates will illustrate many of the unusual dissections, and will include, of course, all parts of the body. Part I. has to do only with the neck. There are two figures in each plate, executed by chromo-lithography, with a reference-text to each plate. We regret the method Mr. Godlee has adopted for distinguishing the parts. Muscles are indicated by Roman capitals; arteries by small italics; veins by Greek small letters; nerves by Arabic numerals; and miscellaneous parts (the "human various" of Silas Wegg) by typographical symbols, such as the \*, ¶, †, =, etc. Had he adopted Mr. Heath's simple method of lines terminating in the parts to be indicated, and numbered with odd numbers on the right-hand side, and even numbers on the left, prolonged and sometimes futile search for an obscure letter or point would have been obviated, and ready reference made certain. The only objection to it is the slight marring of the plates by the lines.

As to the text but little save in way of praise can be said. The dissection is first clearly indicated, and then the parts are described in groups; the muscles first, followed by the arteries, veins, nerves, etc. We have observed but few errors. On p. 22, the triangle in which the thoracic duct is found is said to be bounded by the clavicle, omo-hyoid, and *thyro*-hyoid, instead of *sterno*-hyoid muscle. On p. 42, when both bellies of the omo-hyoid contract, its action is said to be on the hyoid bone; but no allusion is made to its chief function as a tensor of the deep fascia to prevent pressure on the deep veins in inspiration, an action which can often be verified on the living, especially on thin, aged subjects. The omission of all allusion to the comparatively easy ligation of the lingual artery above the hyoid bone in the triangle formed by the digastric and the hypoglossal nerve, is unfortunate.

W. W. K.

ART. XXXIV.—*Preliminary Course Lectures on Physiology*. By JAMES T. WHITAKER, A.M., M.D., Prof. of Physiology and Clinical Medicine in Medical College of Ohio, etc. Crown 8vo. pp. xii., 288. Cincinnati: Chaney R. Murry, 1879.

THIS little book is very different from what we ordinarily expect to find in an elementary treatise. Instead of being a hasty and incomplete summary of the more salient points of physiology, a style of work which is only suitable for those who desire the most superficial information, Dr. Whitaker's lectures are only elementary in that they treat of the "foundation facts and principles on which the stately edifice of physiology is built," while they are in all respects in accord with the latest researches.

They therefore serve as an excellent introduction to more extended study, and are admirably suited to the wants of a first course medical student. The book contains twelve lectures on the influence of physiology on practice, on the conservation of force, on the origin of life, and the evolution of its forms, and on protoplasm, bone, muscle, nerve, and blood; the chapters on bone, muscle, and nerve being particularly good.

The paper, binding, and type are excellent, and the book is unusually free from typographical errors, unless a few such expressions as *cloacum*, *cilium*, *arrectores pili*, *synonim*, etc., may be regarded as such oversights. In subsequent editions, which no doubt will be required, we trust to see the omission of numerous poetical interpolations which are neither instructive nor ornamental.

R. M. S.

ART. XXXV.—*Recent Editions of Works on Surgery*.

1. *The Principles and Practice of Surgery*. By JOHN ASHHURST, JR., M.D., Professor of Clinical Surgery in the University of Pennsylvania. Second edition, enlarged and thoroughly revised. 8vo. pp. 1040. Philadelphia: Henry C. Lea, 1878.
2. *A Manual for the Practice of Surgery*. By THOMAS BRYANT, F.R.C.S., etc., Surgeon to, and Lecturer on Surgery at, Guy's Hospital, etc. Second American from the third and enlarged English edition. Imp. 8vo. pp. 945. Philadelphia: Henry C. Lea, 1879.

1. To one who will carefully compare the recently published second edition of Ashhurst's Surgery with the first edition published in 1871, it will soon be appa-

rent that the author has much revised and enlarged the original work. Though only occasionally have previously expressed opinions been decidedly modified, almost every paragraph bears witness to thorough study of recent contributions to surgical literature, and thoughtful consideration of new views that have during the past eight years been entertained upon questions of pathology and treatment.

For example, we find allusions to Gordon's and Moore's writings upon the mode of production of, and cause of deformity in, fractures of the lower end of the radius; to Bryant's line; to wiring the broken patella; to fat-embolism; to Sutton's fulcrum; to Allis's test for sciatic dislocation; to nerve-stretching in cases of neuralgia and tetanus; to Duret's theory of concussion of the brain; to Martin's bandage; to the use of the Esmarch bandage in the treatment of aneurism; to subcutaneous osteotomy; to Judson's investigations upon lateral curvature; to the recent operations for genu valgum; to the rectal exploration and its dangers; to linear rectotomy; to the removal of the lower end of the rectum; to the use of the elastic ligature in cases of fistula in ano; to aspiration of the bladder; to Battey's operation; to Porro's operation; to laparo-elytrotomy; to cholecystotomy; to Bigelow's litholapaxy. The immovable apparatus in the treatment of fractures is noticed at some length; frequent references are made to the statistics given in the published surgical volumes of the *History of the War of the Rebellion*, and Culbertson's "Prize Essay on Excision of Joints;" tables of cases of ligation of the important arteries have been introduced; the antiseptic dressing, as at present made, is described somewhat in detail; a new paragraph is introduced upon the anatomical origin of cancer.

That, as already stated, the author has modified some of his previously expressed opinions is shown, *e. g.*, by the declared prognosis in cases of gunshot fracture of the vertebræ, "very unfavourable" in the first edition, now "less unfavourable than has been commonly supposed;" again by his estimate of the value of ligation of the common iliac, it being originally stated that the record, "though gloomy, warrants a resort to this proceeding in cases in which milder measures fail," while now it is written that it "hardly warrants a resort to this proceeding unless in very exceptional cases;" again by the paragraph on the statistics of wrist-joint excisions, originally pronounced "not very favourable," now "quite favourable."

We notice that, as in the first edition, Prof. Crosby is spoken of as of New Haven instead of Hanover; and the famous Gage "tamping-iron" case is credited to Prof. Bigelow, instead of to Dr. Harlow, who originally reported it.

2. The very recent date at which we received the second American edition of *Bryant's Surgery* prevents our doing anything more than contrasting some of the views therein expressed with those upon the same subjects given in Ashhurst. The present is likely to be known hereafter as the "antiseptic period," and on taking up a new book, or a new edition, one naturally turns at once to the paragraphs on the treatment of wounds and the causes of certain diseases.

Dr. Ashhurst evidently is, as in 1871, far from being a faithful disciple of Mr. Lister, and is still very skeptical as to the "alleged superiority of the antiseptic method;" nor has Mr. Bryant apparently seen good reason for changing the opinion expressed in the first edition of his work. He says that the "Lister practice" ought to have a fair trial, and be honestly tested; but insists upon it that we should first "have the facts," and regrets (not to say complains), as does Prof. Ashhurst, that the distinguished Clinical Professor of Surgery at King's College Hospital has not, though repeatedly requested so to do, published "the results of his practice as a whole."

The antiseptic catgut ligature is by one (Ashhurst) regarded as "quite safe, at

least for arteries ligated in their continuity," but not so good for wounded arteries, or those divided in amputation, as the ordinary silk ligature; its fault being that "it disappears without dividing the external coat of the artery, and thus does not securely occlude the vessel." The other (Bryant) regards it as "a safer ligature than the silk or hempen, as it does not, like the latter, of necessity require an ulcerative process for its discharge."

Neither of the authors, it may be concluded from what they have written, has any faith in the "germ theory" of the production of pyæmia and its allied diseases.

Respecting the use of the Esmarch bandage we find a rather favourable opinion expressed by both authors, though by both the danger of troublesome after-bleeding is distinctly mentioned.

Due notice is taken in each work of the "immovable dressing" in cases of fracture (the plaster of Paris being preferred); and it is in both recommended, not as a primary, but as a secondary application, because of the danger attending its early employment; a danger which we believe is reduced to a minimum when the Bavarian splint is used, a splint described and figured by both authors.

For fracture of the shaft of the femur Ashhurst recommends the weight-extension apparatus with long side splints, and Bryant the double splint; the former declaring emphatically that he has never seen a cure without shortening; the latter stating that of 31 consecutive cases treated, 18 recovered without any shortening. When the patient is a young child, Bryant advises that the case be treated with the limb flexed at a right angle with the pelvis.

In both works forcible and prolonged taxis in cases of hernia is, of course, strongly reprobated; Ashhurst giving a little longer period of time, during which efforts at reduction may be made. We cannot but think that for the majority of practitioners throughout our country, Bryant's time is the better one, for even the greatest bungler will not be very apt to do much harm in from two to five minutes; and we are forced to believe by what we have seen and heard that the taxis is every year "putting out of order" a great many people.

The vexed question of "what anæsthetic shall we employ?" is in both works left as unsettled as in the earlier editions, and this notwithstanding the fact that within these years very much has been written upon the subject, and some little addition made to our positive knowledge as to how the several agents differ in their action.

In reviewing the first editions of these *Surgeries* we expressed our opinion as to their value, and have only to say at this time that each work, as it now appears, is better, and will be found to be more serviceable to students and general practitioners, than as it was originally presented. It is by no means true, as has been charged, that one is but a mere compilation, and the other superficial in character, and written in most wretched English. Undoubtedly, however, one author has well and judiciously selected, and the other will never be chosen as a model of clear and elegant diction.

P. S. C.

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ART. XXXVI.—*An Introduction to Pathology and Morbid Anatomy.* By T. HENRY GREEN, M.D. Lond. Third American from the fourth revised and enlarged English edition. 8vo. pp. 331. Philadelphia: Henry C. Lea, 1878.

SINCE the publication of the second American edition of Dr. Green's work only two years have elapsed, and the appearance of a fourth English edition is evidence that the book has proved acceptable to the reading part of the profes-

sion. This edition is very little larger than the preceding one, but in the preface the author says that all the chapters have been revised, and the number of illustrations considerably increased. In this, as in the last edition, the chapter on pulmonary phthisis is the best of all, but the other important chapters are fairly apace with the advances in pathological knowledge that are constantly being made. In the chapter on inflammation in scrofulous constitutions, there is an exceedingly good wood-cut of scrofulous inflammation of a bronchus in a child, which shows the extensive infiltration of the bronchial walls with large cells.

In the chapter on tuberculosis of the lung, the illustrations are exceedingly good, and some of them a great improvement on their predecessors. The chapter on inflammation of common connective tissue, though brief, is well epitomized from our knowledge on the subject, but is not so well illustrated as some other work in the volume.

We regard this work as especially valuable to the student, on account of its clearness of style, conciseness of statement and general accuracy, and the numerous illustrations largely enhance its usefulness. We, therefore, cordially commend this third edition as better, in some respects, than the other editions, and well worth perusal.

C. S. B.

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ART. XXXVII.—*On Rest and Pain. A Course of Lectures Delivered at the Royal College of Surgeons.* By JOHN HILTON, F.R.S., F.R.C.S., etc. Edited by W. H. A. JACOBSON, F.R.C.S., Assistant Surgeon to Guy's Hospital. Second edition. 8vo. pp. xii., 299. New York: William Wood & Co., 1879.

THIS great book is too well known to the medical profession to call for an extended notice from us. It has long since taken its place among medical classics, and, from the beauty and simplicity of its style, with the number and value of the suggestions it contains, will ever rank as one of the most notable works produced by the pen of a surgical writer. Yet, while too well known to call for an analytical presentation of its contents to our readers, we cannot resist the temptation to dwell upon some of the characteristics which have made it famous.

It is now an old book, and from that fact alone it will be considered as unworthy of notice by many who expend their energies upon current literature, with the idea that that only is fresh. Yet, as we have carefully read over its pages, the conviction has forced itself upon our mind that in this volume of Mr. Hilton's are contained the germs of many modern improvements in treatment, and that the men who have carefully studied and judiciously followed out the hints contained in it, have both added to the resources of our art and found the result of their study a most profitable investment.

We are acquainted with no book which so forcibly and clearly demonstrates the important bearing of an accurate anatomical knowledge of nervous distribution upon the difficulties of surgical diagnosis as this one, and we feel persuaded that no one can work through the somewhat dry anatomical details it contains, without being convinced of their value as applied to the elucidation of many obscure cases. Of course it will be said that Mr. Hilton, like other lecturers, narrates principally those cases which support his theories, but both the honest simplicity which marks his style and the appeals which his demonstrations make to the common sense of the educated surgeon, go far to carry conviction to the fair minded one.

The work of Mr. Hilton forms the first volume of "A Library of Standard Authors," which is to consist of twelve volumes, to be issued monthly only to those who subscribe for the whole number, at the rate of one dollar each. The



muslin binding is exceptionally good. The wood-cuts, one hundred and nine in number, are coarse, but sufficiently clear, the paper is very fair, but the print is not sufficiently leaded to make the reading of it pleasant. S. A.

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ART. XXXVIII.—*Naval Hygiene. Human Health and the Means of Preventing Disease, with Illustrative Incidents, principally derived from Naval Experience.* By JOSEPH WILSON, M.D., Medical Director U. S. Navy. Second edition. 8vo. pp. 274. Philadelphia: Lindsay & Blakiston, 1879.

Of all men who live by manual labour none fare as badly as those who toil upon the waters at home or abroad. Sailors of all nations are more imperfectly and irregularly fed, clothed, and lodged than their countrymen who are labourers on land. Whether employed in a naval service or commercial marine their condition is comparatively worse than the labouring classes on shore in whatever pertains to personal comfort, health, and peril in time of peace as well as of war.

Generally speaking the class of sailors is constituted of ignorant men who lack the faculty of self-control in a greater or less degree, men who constantly need watchful and kindly guidance of superiors to enable them to gain a very moderately comfortable subsistence by their labour. Very many of the class besides being ignorant are wanting in docility, and are therefore incapable of learning to do properly the simplest things, and never become even moderately expert in the vocation. Whatever they do is awkwardly done, and on this account they are often harshly or unjustly treated by official superiors, who are rarely endowed with more than average intelligence, and sometimes possess brutal or tyrannical tempers which are too often cruelly manifested with impunity. Besides those who are naturally dull of comprehension, there are some who are lazy, or who are addicted to vicious and disorderly ways, and take to the sea to avoid jails and correctional institutions on shore. But whatever be their faults and defects of character sailors are nevertheless brothers, men who form a large and important class of the population, and seem to be entitled to as much humane consideration as the criminal inhabitants of prisons. To ameliorate the condition of these unlucky people afloat, and to render them more respectable and self-respecting everywhere, is a very desirable though not easily achieved purpose. The task includes the difficult work of making official superiors comprehend the methods best calculated to readily manage such thriftless, inconsiderate, and viciously disposed men as are found in ships' companies of both private and public vessels, and to secure from them the largest amount of approved labour at the least cost.

This work of Dr. Wilson is well conceived to contribute very much to this end, and is well calculated to attract the thoughtful attention of those who can control many of the remediable evils which inure to the sailor's life in spite of the very many humane efforts made to remove them. Speaking of the sleeping berths for sailors on board of merchant vessels Dr. Wilson says, p. 22:—

"The triangular space forward which the crew inhabit, the fore-castle, is for the most part really shocking. It is seldom visited by the officers, and is generally filled with disgusting emanations from the untidy persons of those who occupy it. . . . "We sometimes hear complaints of the scarcity of sailors, but under present circumstances we might as well complain that there are few suitable candidates for the penitentiary. Though such laborers may be profitably used, it is to be hoped that the number of men who reach this degree of misery may not be increased."

The work of Dr. Wilson is founded on a naval experience of more than a third of a century, very nearly nineteen years of which have been passed at sea, and

is benevolently designed to instruct those whose position on board of ships enables them to exercise a controlling influence for good or ill over rational methods of preserving health, such as captains, "executive officers," and others, rather than as a complete or systematic treatise on naval hygiene for the exclusive use of medical officers. The routine incidents of a cruise on the north Atlantic station, in 1860, from the moment the officers and crew are placed on board the ship until they are finally discharged, are in succession made occasion of carefully considered comments on every thing relative to the preservation of health.

After an "introductory," which states that hygiene treats of the means of preserving health, and that health consists in the normal performance of the functions of all the organs of the body, and that they may be disturbed through the influence of the natural forces, heat, light, electricity, he proceeds first to notice the general forms of the several varieties of war and merchant vessels; and the divisions of their hulls into many apartments for different purposes are so plainly described that landsmen may understand them. The sources of disease ascribable to construction or plan are mentioned, and means of obviating them are suggested. He believes that "the metals used in ship-building are in many ways beneficial to health," and "that health is constantly improving through their influence." The colour of the paints applied to various parts of the ship, inside and out, is of considerable importance to the health and comfort of her inmates; but the selection may be determined on military reasons nevertheless, or by the exigence of nautical fashion.

The reason why the number of good and reliable seamen is inadequate to the demands of commerce and the navy is that the discomforts which are incident to sea life, and the wretchedness which is occasionally added by caprice, neglect, and indifference, lead the best men to escape from the service at the end of the first cruise, unless they have been well treated or advanced in accordance with their merit. Much is now being done with encouraging success, to improve the condition and character of the typical sailor, but the time when young men will choose this as they do other laborious employments is perhaps far distant.

A man falling overboard is made the occasion to describe the methods of resuscitating drowned persons; and the rolling and pitching of the ship at sea leads to comments on sea-sickness. Remarks on the social condition of a crowd of men, strangers to each other when first placed on board, introduce a consideration of nostalgia and its causes and treatment.

Dr. Wilson advises incidentally the habitual wearing of the cummerbund or flannel bandage as an efficient protection against dysentery in hot climates. He is of opinion that sailors should not be discouraged in the use of tobacco, or deprived of "mending day," which is well described.

The several articles which constitute sailors' rations are considered somewhat in detail, and methods of cooking them are given, with remarks on the arrangement of meals and nutrition. The methods of preserving fresh various articles of diet for use at sea are described. Canned meats and desiccated vegetables do not find much favour in the naval service. Sources of supply of potable water, the manner of its preservation at sea, purification, filtration, the aëration of distilled water, alcoholic and other drinks, are duly considered.

About fifty pages of the work are appropriated to zoology and botany, including remarks on poisonous fishes and descriptions of some tropical fruits.

The arrival of the ship at Vera Cruz affords the author an opportunity to speak of "liberty on shore" and the perils of health to which the men are exposed. The importance of ventilation is sufficiently well explained, and methods of cleaning ship are mentioned.

In this connection attention may be directed to the annual report of Commodore R. W. Shufeldt, Chief of the Bureau of Equipment, to the Secretary of the

Navy, Oct. 1877. He states that in one class of ships the air-space allotted to each officer is 324 cubic feet, and to each man 58 cubic feet, in another class 273 cubic feet to each officer, and 68 cubic feet to each man; and in a third class, 1158 cubic feet to each officer, and 81 cubic feet to each man. He says "a ship may be ever so perfect in its construction and armament, she loses her significance as a man-of-war unless manned by a vigorous crew. It is simply impossible to expect men to retain their health, if compelled to berth and mess in the dense and mephitic atmosphere which is the natural result of their crowded quarters. . . . Ventilation of our ships has never received the attention it imperatively demands. I respectfully urge upon the Department the propriety of appointing a board of medical officers to report upon the subject, and to devise a method whereby the object may be assured." This report has received no more attention than reports of many medical officers on the same subject, made from time to time.

The return of the ship, touching by the way at Havana, to be immediately equipped for war, gives the author opportunity to speak of quarantine, the effects of sudden transition from hot to cold climates and the reverse, preparation for battle, transportation of wounded, epidemics, endemics, etc. etc.

The above summary is sufficient to indicate the scope and general nature of the work, which we commend to those for whose information it was especially written. The conscientious, painstaking character of the author, and his long experience give assurance of the reliability of his statements.

The present edition has been carefully revised, and about forty pages added. The text is illustrated by four coloured lithographic plates and thirty-four well-executed wood-cuts.

W. S. W. R.

ART. XXXIX.—*Hydrocele: its Several Varieties and their Treatment.* By SAMUEL OSBORN, F.R.C.S. 18mo. pp. vi., 84. London: J. & A. Churchill, 1878.

THIS little book is an amplification of two articles printed in volumes v. and vii. of St. Thomas's Hospital Reports.

Mr. Osborn's aim seems to have been to present to his readers a conspectus of the views of others, with a summary of generally approved remedial measures, rather than to bring new facts or observations before them. Indeed, after again perusing the book, we have been unable to find one statement which is new, or that can be construed into an addition to surgical knowledge. The medical student who by some accident has never happened to hear the subject lectured upon, may find in this volume an expansion of the statements contained in some text-books, but nothing more; while the intelligent surgical practitioner will inevitably conclude that, while reading this monograph, he has been engaged with twice-told tales.

It may however be urged, that there are many different tastes in this world, and that some prefer to search for information in various little tracts like the present, rather than to examine the contents of more bulky treatises. This class of readers will find Mr. Osborn's work exactly suited to them, for the book is well written, and contains just what they will find in more condensed form in many modern surgical text-books. His account of encysted hydrocele is more nearly exhaustive than other portions of the book, and the anatomical details which Mr. Osborn gives are exact and clearly stated.

Mr. Osborn writes simply and pleasantly, and the book is very well printed, while its general appearance corresponds with the excellent reputation which justly belongs to the publishing house from which it issues.

S. A.

# QUARTERLY SUMMARY

OF THE

## IMPROVEMENTS AND DISCOVERIES

IN THE

### MEDICAL SCIENCES.

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#### ANATOMY AND PHYSIOLOGY.

##### *Arrest of Development in the Sternum.*

At a late meeting of the Brooklyn Anatomical and Surgical Club (*Proceedings of Med. Society of the County of Kings*, Jan. 1879), Dr. CHARLES JEWETT presented the sternum removed from the body of the late Dr. E. A. Groux, who died October 15, 1878, aged 45 years, with an account of his case, which during life had been an object of medical interest throughout the world.

The sternum was an example of complete median fissure of the bone with no other failure of development. At the autopsy an incision was made through the skin and superficial fascia which opened directly into the anterior mediastinum. No other structure bridged the space between the lateral halves of the bone. The heart was found normal in size and shape, and normally situated, except that the position was slightly higher than usual, the apex presenting at the level of the upper border of the fifth rib. The right auricle lay wholly to the right of the median line. The position of the right ventricle corresponded precisely with that of the pulsating tumour observed by the committee of the New York Pathological Society (*Amer. Med. Monthly*, Jan. 1859), just beneath the integument in the medio-sternal space and extending from the second to the fourth intercostal space and from the median line to the left edge of the fissure.

In looking at the sternum it is observed that were the lateral halves united a slight deficiency in width would be seen at the upper portion of the manubrium, perhaps one-half inch. The lower segment of the gladiolus would also be found somewhat smaller than usual. Otherwise there is no deficiency of bony substance.

The articulations of the fifth, sixth, and seventh costal cartilages were found to deviate somewhat from their normal relations to the lower segment of the gladiolus. While the fissure divides the entire bone, the lateral portions of the lower segment of the gladiolus articulate with each other. Each articular surface is covered by a cartilage, and the two parts of the bone are bound together by external ligamentous bands. The articular cartilages of this joint blend below with the ensiform appendix.

The vertical depth of the fissure from the level of the sterno-clavicular articulation to the bottom of the cleft is four inches. Width at the level of the first costal cartilage, one inch. Width at widest part, 1.4 inch.

The specimens has been carefully prepared by Dr. Pilcher, for the Museum of

the Anatomical and Surgical Club, to which it has been formally donated by the widow of Dr. Groux.

Dr. Groux is supposed to have possessed the power to arrest the action of the heart at will without producing any other disturbance of his usual condition. On taking two or three quick inspirations, by an effort the cardiac movements were apparently stopped for about twenty seconds, and he never deemed it prudent to prolong the effort beyond that time. The committee of the New York Pathological Society "were not able to see that he did anything else than to stop the pulse at the left wrist, the circulation continuing everywhere else," and they attributed this power to stop the pulse at the left wrist to the unusual mobility of the clavicle, by which the subclavian artery was compressed at the top of the chest.

Appended to the paper is a bibliography of the malformation.

### *The Eustachian Tube.*

The action of the palatal muscles on the Eustachian tube is the subject of an interesting lecture delivered by Professor LUCAE, to the Physiological Society of Berlin, and published in a recent number of Virchow's *Archiv*. A short time ago, in the same journal, Lucae recorded some observations on an individual whose nasal cartilages had been destroyed by lupus, which observation went far to decide the much-disputed question of whether the Eustachian tube is permanently open or closed. They confirm the statement of many previous observers that the tube cannot be regarded as permanently open. It is rather loosely closed, and opens in different individuals with different degrees of readiness on the occurrence of variations in the pressure of air in the pharynx and tympanic cavity respectively. During the act of swallowing, the tube is, as Michel maintained, closed, and it is also closed during phonation. The observations seemed to show that the view that the tensor opens the tube during the act of swallowing is erroneous, although the muscle probably assists in opening the tube at the end of the act of deglutition, as soon as the action of the levator is over, and the soft palate again falls. During deglutition, phonation, aspiration, and forced breathing, the raised palate presses together the lips of the opening of the Eustachian tube, and thus air is forced towards the middle ear.

In his recent lecture Lucae has given the results of his investigation of two other cases in which the nasal cartilages were destroyed. The changes to be observed in the mouths of the Eustachian tubes during movements of the soft palate were exactly the same as those seen in the former case. When the palate was raised the lips of the tube were pressed together, and were separated when the palate fell. No movement could be perceived in the anterior lip, but the cartilaginous rim was each time moved from the anterior lip towards the posterior wall of the pharynx, whilst the floor of the tube was pushed into the triangular space thus formed. During this action, if there was a drop of fluid in the mouth of the tube, it was moved towards the middle line of the body, especially during the powerful elevation of the palate which occurs during the act of swallowing. The defect of the alæ nasi was in one case so great as to permit the introduction of a small furrow, which, when the soft palate was raised in deglutition and phonation, became almost obliterated. On the ground of observations on the pressure on the middle ear during deglutition, Lucae thinks it highly probable that external closure of the tube is associated with an internal dilatation, either by simple mechanical inflation or simultaneous action of the tensor palati seu dilator tubæ, but no direct proof of

this has yet been given. The closure of the tube, when the palate is raised, is no doubt the reason why, when fluid is injected into the nasal chamber—by which a reflex water-tight closure of the posterior nares by the palate is produced—no liquid gets into the Eustachian tube, unless the patient swallows while the douche is being employed. But why, it may be asked, should fluids pass into the tube during the act of swallowing if the tube is closed? It must be remembered that deglutition is a complex action. Physiological treatises are silent on the question of the exact time at which the palate is raised. Lucae has endeavoured to answer the question by a method devised by Czermak for the study of the movements of the palate during phonation. A curved wire was so placed in the nasal cavity that the curved portion lay upon the soft palate, the movements of which were shown by the projecting part of the wire, to which a long straw was attached. It was found that, as Gentzen observed in a case in which the palate was exposed by the removal of an orbital tumour, the palate was raised progressively in the passage through the series of vowels—*a, e, i, o, u*. At the commencement of deglutition the palate was raised as high as in the pronunciation of *u*, and the fall of the palate, and therefore the opening of the mouth of the Eustachian tube, coincided with the contraction of the constrictors of the pharynx and the last portion of the act of deglutition proper. It does not therefore succeed deglutition, but occurs during the last portion of the act, and hence the passage of liquids at this time into the tube from the nose. These observations have led to certain contrivances for maintaining the closure of tube during the employment of the nasal douche, so as to avoid the risk of the awkward accident of the passage of liquid into the middle ear. Fraenkel, for instance, recommends that the patient should be made to pronounce the vowel *u*, while Störck advises water to be kept in the mouth ready to be swallowed without being actually swallowed, which leads to elevations of the soft palate only. The observations show also that the end of the act of deglutition is far more favourable than its commencement for the forcible inflation of the Eustachian tube and tympanic cavity by the method of Politzer.—*Lancet*, Jan. 4, 1879.

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## MATERIA MEDICA AND THERAPEUTICS.

*On the Biliary Secretion of the Dog with reference to the Action of Cholagogues.*

DR. WILLIAM RUTHERFORD, Professor of the Institutes of Medicine in the University of Edinburgh, has presented a report on this subject to the Scientific Grants Committee of the British Medical Association (*Brit. Med. Journ.*, Feb. 8, 1879), of which the following is the summary of results obtained.

1. In a curarized dog that has fasted eighteen hours, the secretion of bile is tolerably uniform during the first four or five hours after the commencement of the experiment, but falls slightly as a longer period elapses. Its composition remains constant.

2. Croton-oil is a hepatic stimulant of very feeble power. The high place assigned to it by Röhrig was probably the result of his imperfect method of experiment.

3. Podophyllin is a very powerful stimulant of the liver. During the increased secretion of bile, the percentage amount of the special bile solids is not diminished. If the dose be too large, the secretion of bile is not increased. It is a powerful intestinal irritant.

4. Aloes is a powerful hepatic stimulant. It renders the bile more watery, but at the same time increases the excretion of biliary matter by the liver.

5. Rhubarb is a certain, though not a powerful, hepatic stimulant. The bile secreted under its influence has the normal composition.

6. Senna is a hepatic stimulant of very feeble power. It renders the bile more watery.

7. Colchicum increases to a considerable extent the amount of biliary matter excreted by the liver, although it renders the bile more watery.

8. Taraxacum is a very feeble hepatic stimulant.

9. Scammony is a very feeble hepatic stimulant.

10. Gamboge is an intestinal, but not a hepatic, stimulant.

11. Castor oil stimulates the intestinal glands, but not the liver.

12. Calomel stimulates the intestinal glands, but not the liver.

13. Euonymin is a powerful hepatic stimulant. It is not nearly so powerful an irritant of the intestine as podophyllin.

14. Sanguinarin is a powerful hepatic stimulant. It also stimulates the intestine, but not nearly so powerfully as podophyllin.

15. Iridin is a powerful hepatic stimulant. It also stimulates the intestine, but not so powerfully as podophyllin.

16. Leptandria is a hepatic stimulant of moderate power. It is a feeble intestinal stimulant.

17. Ipecacuan is a powerful hepatic stimulant. It increases slightly the secretion of intestinal mucus; but has no other stimulant effect on the intestine. The bile secreted under the influence of ipecacuan has the normal composition.

18. Colocynth is a powerful hepatic as well as intestinal stimulant. It renders the bile more watery, but increases the secretion of biliary matter.

19. Jalap is a powerful hepatic as well as intestinal stimulant.

20. Sodium-sulphate is a hepatic stimulant of considerable power. It also stimulates the intestinal glands.

21. Magnesium-sulphate is an intestinal but not an hepatic stimulant.

22. Potassium-sulphate is a hepatic and intestinal stimulant of considerable power. Its action on the liver is, however, uncertain, probably owing to its sparing solubility.

23. Sodium-phosphate is a powerful hepatic, and a moderately powerful intestinal stimulant.

24. Rochelle salt is a feeble hepatic but a moderately powerful intestinal stimulant.

25. Ammonium-chloride stimulates the intestinal glands, but not the liver.

26. Dilute nitrohydrochloric acid is a hepatic stimulant of considerable power.

27. Mercuric chloride (corrosive sublimate) is a powerful hepatic stimulant, while it is a feeble intestinal stimulant. Although calomel is an intestinal but not a hepatic stimulant, excitement of the liver as well as of the intestinal glands results when mercuric chloride and calomel are administered together.

28. Calabar bean stimulates the liver, but not powerfully, unless it be given in very large doses.

29. Atropia-sulphate antagonizes the effect of Calabar bean on the liver, and thereby reduces the hypersecretion of bile produced by that substance. It does not, however, arrest the secretion of bile, and, when given alone, does not notably affect it.

30. Menispermis does not stimulate the liver. It slightly stimulates the intestinal glands.

31. Baptisin is a hepatic and also an intestinal stimulant of considerable power.

32. Phytolaccin is a hepatic stimulant of considerable power. It also slightly stimulates the intestinal glands.

33. Acetate of lead, in large doses, somewhat diminishes the secretion of bile, probably by a direct action on the liver.

34. Ammonium-phosphate is a moderately powerful hepatic stimulant of the liver. It does not stimulate the intestinal glands.

35. Tannic acid does not affect the secretion of bile.

36. Hydrastin is a moderately powerful hepatic stimulant, and a feeble intestinal stimulant.

37. Juglandin is a moderately powerful hepatic and a mild intestinal stimulant.

38. Sodium-benzoate is a powerful hepatic stimulant. It is not an intestinal stimulant.

39. Ammonium-benzoate stimulates the liver, but not quite so powerfully as the sodium-salt of benzoic acid. It does not stimulate the intestinal glands.

40. Benzoic acid stimulates the liver, but, owing to its insolubility, its action is less rapid and much less powerful than that of its alkaline salts.

41. Sodium salicylate is a very powerful hepatic stimulant. It does not notably stimulate the intestinal glands.

42. Sodium-chloride is a very feeble hepatic stimulant.

43. Sodium-bicarbonate has scarcely any appreciable effect as a hepatic stimulant, even when given in very large doses.

44. Potassium-bicarbonate feebly excites the liver, and that only when given in very large doses.

45. Potassium-iodide has no notable effect on the biliary secretion.

46. Sulphate of manganese does not excite the liver, though it is a powerful excitant of the intestinal glands.

47. Morphia has no appreciable effect on the secretion of bile, and does not prevent the stimulating effect of such a substance, as sodium-salicylate.

48. Hyoseyamus does not notably affect the biliary secretion, and does not interfere with the stimulating effect of such a substance as sodium-salicylate.

49. Pure diluted alcohol does not affect the biliary secretion.

50. Jaborandi is a very feeble hepatic stimulant.

All the above conclusions are based on experiments performed on the dog, and have no reference to any observations made on the human subject.

#### *The Action of Pituri on Man.*

Dr. SYDNEY RINGER contributes to the *Lancet* (March 1, 1879) a short article on this interesting drug, which is derived from *Duboisia Hopwoodii*, and belongs to the order Solanaceæ, but differs strangely from the other medicinal plants derived from this family. From twelve observations made with pituri on man, Dr. Ringer finds that it produces faintness, pallor, giddiness, tremor, hurried and superficial breathing, increased frequency of pulse, perspiration; in larger doses, salivation, drowsiness, convulsive twitchings, spasmodic rigidity of the extremities. In small doses, internally administered, it contracts, in large it widely dilates the pupils; locally applied, it contracts and then widely dilates the pupils. It antagonizes the action of pilocarpine and muscarin on the frog's heart.

Whilst retaining many of the properties of solanaceous plants, pituri differs in some striking particulars. Like atropia, hyoseyamia, daturine, and duboisia, it produces general weakness and drowsiness, dilates the pupil, quickens the respiration, increases the frequency of the pulse, and antagonizes the action of muscarin on the heart; but it differs from these alkaloids in producing salivation and



increased secretion from the skin, in this respect corresponding to muscarin and pilocarpine, with which substances it is further allied, for muscarin produces giddiness, fainting, prostration, stupor, breathlessness. Internally given, it contracts the pupil; applied locally to the eye, it dilates the pupil; whilst, like pilocarpine, it produces muscular trembling and accelerated pulse.

Mr. Tweedy saw the patients and examined the eyes while under the influence of pituri. He reports as follows: "I have little to add to your account of the effect on the eye of the local application of a solution of pituri, except to note that, although the pupil was widely (not fully) dilated, the accommodation was almost unaffected. The patients could read quite well, and they did not complain of much mistiness. Pituri seems to be a weak mydriatic; strong enough to dilate the pupil for a few hours, but not sufficient to impair the action of the ciliary muscle. Except the smarting, a weak solution of atropine—say one-thirtieth of a grain to an ounce—would produce the same symptoms as the one per cent. solution of pituri, perhaps even including the preliminary contraction. Ophthalmoscopically I discovered nothing."

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#### *The Therapeutic Value of Salicylic Acid.*

Professor BARTELS (*Deutsche Medic. Wochenschrift*, No. 32-35) states that salicylate of soda acts as powerfully as salicylic acid, although containing only 0.68 of the free acid; that no deep-seated lesions of the intestinal mucous membrane occur even after large doses; but that eruptions and loss of appetite frequently occur in non-feverish patients after the use of the free acid.

The action of salicylic acid is twofold, antipyretic and specific. The antipyretic action may be observed in any febrile patient. In the hectic fever of phthisis it has been given with varying results. In some cases the action was slight or the drug was not well borne, whilst in others it was given for months, producing cessation of the daily rise of temperature, with wonderful restoration of strength and of weight. In typhoid fever, the nerve symptoms became so severe during its administration that it was discontinued. In other fevers it was found to be much less powerful in its action than quinine. Diminution in the frequency of the pulse, profuse sweating, dryness of the mouth, and slight albuminuria, also result from its employment. In diabetic patients, large doses produced severe nervous symptoms; staggering as in intoxication, delirium, and even maniacal violence. These bad effects often restrict the use of the salicylic preparations to small doses, thus decreasing its value as an antipyretic.

Dr. Bartels has employed salicylic acid as a specific in acute rheumatism and in diabetes mellitus, with great success. In the former there was a steady fall of temperature, with remission of the symptoms, and in a few days convalescence; good results were obtained also in chronic rheumatic arthritis. In diabetes mellitus large doses were given, which brought on brain-symptoms, but there was great reduction in the amount of sugar in the urine, and increase in the weight of the body. He concludes that the salicylate of soda has no prophylactic action against infectious diseases, for a diabetic patient, whilst taking large doses of this drug, was seized with erysipelas and died.—*London Med. Record*, Dec. 15, 1878.

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#### *Physiological and Therapeutical Effects of Adonis Vernalis.*

As it had been noticed that the effects caused by an extract of *adonis vernalis* were similar to those produced by *digitalis*, and that in some cases of compensatory troubles the action of the heart could be restored by it, even if *digitalis* had proved unsuccessful, BUNNORF undertook, at Professor Botkin's instigation, to make a series of experiments on frogs, which he subsequently published in the

*St. Petersburg Med. Woch.* (January 6, 1879). The results of his experiments are as follows: A diluted solution of the extract. *adonis vernalis* aquosum was injected into the crural lymph-bag of a frog, the heart of which had previously been laid bare. It was then noticed, after a certain lapse of time, which in most cases was in indirect proportion to the dose which had been injected, that the ventricle began to contract more strongly. During the diastole the surface of the latter was covered by swellings of different size, resembling aneurisms. These disappeared entirely during the diastole. In a few minutes the contractions of the ventricle decrease in number, though not in strength, and the swellings become much larger. Later on the ventricle often remained for several seconds in systole, the sinus venosus and the auricles were considerably dilated and worked unsuccessfully; at last, after two to four contractions of the auricles a small quantity of blood passed into the ventricle, which again contracted spasmodically, and this was repeated for a few minutes. At last the heart assumed a very characteristic shape, the ventricle was strongly contracted and sometimes very pale, the atrium and sinus venosus were considerably dilated. The contractions of the heart and sinus went on for some time, then stopped, and the heart ceased to beat, still retaining the shape already noted. The frog generally survived the operation, and jumped about, although his heart had ceased beating. If the heart in this state is stimulated by pricking the ventricle with a needle, it responds at first by a few contractions of the atria and the ventricle; after a while the prick only calls forth a few useless contractions of the atria. In short, after a certain time, stimulation by pricking has not the least effect in causing the heart to pulsate. The heart retains its very characteristic shape in spite of all stimulations or irritations which may be applied, such as hypodermic injections of atropin, faradic currents, section of the vagus nerve on both sides, etc. All these experiments, combined with the clinical experiences, lead to the supposition that *adonis vernalis* contains a poison analogous to digitalis, which strongly affects the heart, but has certain peculiar properties, one of them being the total absence of dangerous effects, even when this has been taken for a long time consecutively.—*London Med. Record*, Feb. 15, 1879.

#### *First Insensibility from the Inhalation of Ether.*

At a late meeting of the Therapeutical Society of New York (*New York Med Journal*, March, 1879), Dr. R. F. WEIR, Chairman of the Committee on Surgical Procedures and Appliances, presented a report on the first insensibility from ether, as described by Dr. John H. Packard in the *American Journal of the Medical Sciences* for July, 1877.

Dr. Weir stated that a number of cases have been reported to the committee confirmatory of the statements of Dr. Packard, but certain differences were observed. No question as to the satisfactory degree of anæsthesia exists, but the duration of it in several instances exceeded the time allotted to it by Dr. Packard—occasionally reaching to three minutes; also, while all recollection of pain was done away with, yet at times the patients would by movement, and sometimes by cries, give evidence of sensation during the incision; and, still further, it was noticed by Dr. W. T. Bull and himself that, even when the insensibility was marked, muscular relaxation was oftentimes insufficient to permit of a reduction of a dislocation or a displaced fracture.

One case reported by Dr. Gibney shows that in chloroform inhalation the "first insensibility" exists—a point upon which Dr. Packard, from want of experience, was unable to speak. Dr. Weir adds that this "first insensibility," or, as it is commonly called in New York, "primary anæsthesia," has now become fully established in the practice of the New York and Roosevelt Hospitals.

*Dichloride of Ethidene as an Anæsthetic.*

The Scientific Grants Committee of the British Medical Association have received from a special committee a report (*British Med. Journal*, Jan. 4th and 25th, 1879) upon the action of this anæsthetic, in which it is claimed that dichloride of ethidene presents all the advantages of ether, without any of its disadvantages; and that the following opinion of Steffen, given in Binz's *Evidence of Therapeutics*, p. 39, is correct in most particulars: "It is said to have the following advantages over chloroform, which it resembles in its ultimate action, namely, a pleasanter smell, the power of producing narcosis more rapidly, as well as without excitement or vomiting, more rapid recovery without after-effects, and altogether less danger." In their experience, narcosis has not been produced more rapidly than with chloroform, but rapidity of narcosis depends very much on the mode of administration.

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MEDICINE.

*Intravenous Injection of Milk in Anæmia.*

N. WULFSBERG has made a series of researches on animals on the effects of the intravenous injection of milk, recommended by Guillard Thomas, as a means of preserving life in cases of hemorrhage and other forms of anæmia. He injected about 250 grammes, and examined the blood, especially with a view to determine whether, as Donné stated in 1844, the globules of milk were converted into white corpuscles. He found that the white corpuscles undoubtedly increase in number, but only after having first taken up—in fact, eaten—the milk spheres. He was unable to preserve the life of dogs by this means; their body weight diminished, and they died without obvious disease, and he found hemorrhagic infarcts in the lungs. He found it to be impossible to maintain the life of animals by subcutaneous injections of fresh milk as they became atrophic. If about .75 per cent. of the estimated weight of blood were withdrawn from dogs, they bore the intravenous injection of milk well; but when large quantities were introduced they rapidly died. The injection of milk caused the sounds of the heart, which were previously inaudible, to become clear and distinct. He thinks, however, a milk injection can never supply the place of an injection of blood.—*Lancet*, Dec. 7, 1878.

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*On the Action of Salicylate of Soda in Acute Rheumatism.*

M. EDMOND MARROT presents (*Archives Gén.*, Feb. 1878) the following conclusions concerning the action of salicylate of soda in acute rheumatism, deduced from an examination of the blood and urine:—

1. During the course of acute articular rheumatism the quantity of urine notably diminishes, the proportion of uric acid increases, and this increase is not to be explained by the diminution of the quantity of urine; the increase is absolute.

2. In those cases in which acute articular rheumatism has been left to itself, the cure is shown by a marked increase, during several days, of the quantity of urine, and by the return of the proportion of uric acid and urea to its original figure.

3. The salicylate of soda, administered during the period of acute articular rheumatism, hastens, in some degree, this natural crisis. One or two days after being administered the urine becomes very abundant, clear, and of a low density. There is a relative polyuria; the quantity of urea and of uric acid diminishes in

very large proportions. An interesting thing to observe, is that these modifications of the urinary liquid are produced independently of all question of temperature.

4. In cases of chronic articular rheumatism the quantity of uric acid and of urea is rather diminished. Here the use of salicylate of soda has no useful result. When a sufferer from chronic rheumatism is placed in baths of a high temperature the amount of uric acid contained in the urine is noticeably increased. Thus, as Professor Laségue has demonstrated, baths of a high temperature are of great service in chronic rheumatism.

5. The salicylate of soda, like baths of a high temperature, does not increase specially the anæmia in acute articular or in chronic articular rheumatism.

6. During the course of either acute articular rheumatism or of chronic articular rheumatism the quantity of phosphoric acid is diminished, and so remains, whatever may be the treatment employed.

#### *Rheumatism of the Diaphragm.*

Dr. MADER, in the yearly report of the Rudolf Institution in Vienna (*Allgemeine Wiener Medizin. Zeitung*, November 5) remarks that the diagnosis of a rheumatic or neuralgic affection of the diaphragm is evidently more a matter of inference than of certain evidence. Yet from time to time cases come under observation, which scarcely admit any other explanation. In the present instance, the patient was a powerful muscular butcher, twenty-seven years of age, who was attacked one morning with very severe pain, extending from the scrobiculus cordis to the back, and greatly impeding respiration. The breathing was quick, short, and superficial; purely thoracic. Movements of the abdominal walls, indicating contraction of the diaphragm, were almost entirely absent. There was much turgor of the face, but no marked febrile symptoms. Nothing abnormal was found on examining the chest. A subcutaneous injection of morphia in the epigastrium was followed by a cessation of pain and by sleep. Next morning the patient was free from all difficulty of breathing, but he complained of pain in the right scapular region. This also was relieved by injection of morphia, and the patient was discharged cured on the third day.—*London Med. Record*, Dec. 15, 1878.

#### *Syphilitic Epilepsy.*

Dr. T. S. DOWSE, in the *Practitioner* for October, 1878, gives a summary of his observations upon two hundred and seventy-four cases of epileptiform seizures of an undoubted syphilitic origin. As the result of acquired syphilis Dr. Dowse believes epilepsy to be extremely rare, but, in its hereditary form, producing, as it appears to do, an unstable and defective evolution of the nervous centres, to a degree far beyond any other agency; primary idiopathic epilepsies are more due to hereditary syphilis than to any other causes. Acquired syphilis does not predispose a stable brain and nervous system to attacks of epilepsy, *petit mal*, or epileptoid seizures, unless under two conditions—namely, first from absolute organic change in the nervous substance (vessels included), and, secondly, where albuminoid syphilis has so impaired the vaso-motor centres and vascular functions of repletion, exchange, and repair, that blood becomes not only attenuated but loaded with effete products. Acquired syphilis has, in some cases, actually relieved unstable brains during the secondary stages, and for some years subsequently from the epileptogenous tendency, which, however, has returned with tenfold violence in later years. In other cases, a patient suffering from acquired syphilis sustains an injury to the head and becomes epileptic, whereas, had he not been syphilized, this would not have occurred. Dr. Dowse has met with

several similar cases, in which, moreover, the epileptic habit has become confirmed, and been transmitted to the offspring. In diagnosing syphilitic epilepsy we must first consider the two classes of epileptics—the one where the mind between the seizures is unaffected, as in such cases as Cæsar, Napoleon, and many others, and where there is more or less mental derangement between the attacks. It is to the latter class of cases that syphilitic epilepsies essentially belong. Should a man or woman be attacked with epilepsy between thirty and forty years of age, without any hereditary predisposition or a previous seizure, then a syphilitic origin may be suspected. If between the attacks there be more or less mental derangement, the diagnosis is simplified, and still more so if there be a paresis more or less profound, localized or unilateral, but gradually passing off after the epileptiform seizure. The reflex processes are rarely, if ever, completely absent. The iris may contract under the influence of a strong light; the lids close when the conjunctiva is tickled, and a state of subconsciousness rather than of profound coma is a prominent feature from first to last. The stages of the attack are all ill-defined and merge the one into the other. Rarely is there the general tonic spasm with thotonism. Pallor rather than cyanosis is the facial exponent, and the fit is prolonged often many hours, with intervals of wandering, delirium, and excitement. Foaming at the mouth is less common than a profuse flow of saliva, and all sorts of cries are associated with the seizure; but rarely, as Romberg expresses it, “Shrill and terrifying to man and beast.”

As to albumen in the urine, it is present in but few cases; but epileptoid seizures, associated with albuminoid syphilis and a plentiful secretion of phosphatic albuminous urine, are not uncommon.

[Several valuable contributions have been made to this subject during the last few years in the pages of the various medical journals, references to which, up to the end of 1876, may be obtained by turning to the *Medical Digest*, section 1307:5; since then, Dr. Dreschfeld, *Lancet*, February, 1877, p. 269; an able editorial review on Jacksonian epilepsy, *Lancet*, August, 1877, p. 171; and Dr. Ferrier, *Medical Times and Gazette*, April, 1878, p. 456, have added to the literature of the subject.]—*Lond. Med. Record*, Dec. 15, 1878.

#### *A New Symptom of Irritation of the Facial Nerve.*

Dr. LEUBE describes (*Aerzt Intellig.-Blatt*, No. 53) the case of a woman, aged sixty-two, who had been suffering from spasmodic tic douloureux for two or three months. It began with conjunctivitis, which was followed by blepharospasm; the spasm then spread over other branches of the facial nerve. The platysma myoid was the first muscle affected by the spasm, then followed the other muscles of the face. The spasms were so violent that the patient declared she felt as if her whole lower jaw were being torn away. At first, there was profuse salivation, but this gradually decreased. The spasms were clonic bilateral, and extended to all the muscles supplied by the facial nerves, specially to the orbicularis palpebrarum and the platysma myoides. The paroxysms followed in quick succession, but sometimes ceased altogether for several hours. When the paroxysm reached its climax, the patient sometimes uttered a peculiar sibilant sound, which could be produced by drawing the soft palate upwards, at the same time contracting the uvula and performing expiration. It was, therefore, at once suspected that, even while the spasm lasted, the muscles of the palate were convulsively contracted. This supposition was verified by subsequent laryngoscopic examination during the spasm. If the tongue were slightly depressed, it was easily seen that, when the paroxysm was very violent, the palate, which until then had been apparently in a rather relaxed condition, suddenly was contracted

and drawn upwards, and the uvula, contracting also, almost disappeared. Dr. Leube, therefore, supposes that the sibilant sound, as well as the spasmodic contraction of the palate, were due to the part which those branches of the facial nerve that supply the palate took in the spasm. It was not possible to prove whether those fibres of the facial nerve which stimulate the secretion of the saliva were also excited. The treatment consisted in giving Fowler's arsenical solution, either internally or hypodermically, and the results were most gratifying.—*British Med. Journal*, Feb. 1, 1879.

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*Lead-Palsy cured by Magnetic Contact.*

M. DEBOVE communicated, at the meeting of Jan. 24th of the Société Médicale in Paris, the following case, which has a special interest in relation to M. Charcot's recent studies of the influence of magnets on human diseases. It is reported as a case of old hemiplegia, brought on by lead-poisoning, cured by a single application of magnets, in a patient who was not hysterical. The patient, aged 26, a painter by profession, was received into the Hôtel Dieu in August, 1878, suffering from symptoms of lead-poisoning, such as convulsions, coma, etc. These symptoms disappeared in a few days, but the patient retained a complete left hemiplegia. There is no doubt now that saturnine hemiplegia really exists, five or six cases having come under observation, the first of which have been observed and described by M. Vulpian. M. Debove was, therefore, fully justified in considering the present case as a similar one. From August till January, the patient remained in the same state, without improving much. Both the mobility and sensibility of the whole left side were affected; if pricked with pins, the patient only felt the pricks on the inner surface of the arm. The left side of the tongue was affected in a similar manner; the sensation of taste was lost on the left side of the tongue; the left side of the pharynx could be tickled without provoking any reflex movement; the patient could not smell with the left nostril; his hearing was affected in the left ear; the left cornea was insensible; the visual perception had also greatly decreased; the retina was partly insensible. There were also scotomata of the left eye. M. Debove resolved, then, to try the experiment of applying a magnet to his patient. He accordingly took him to the Salpêtrière, where all the necessary apparatus are to be found. The patient's left hand was placed between the two poles of Faraday's electro-magnet, and, in a very short time, not only general sensibility, but also the particular sensibility of some of the organs of sense, was restored. During the following fortnight, the patient progressed favourably, and has now almost entirely recovered both sight and smell. The sense of taste alone has not yet been quite restored, and the sole of the left foot has remained insensible. This case will give rise to many objections. But M. Debove, foreseeing the latter, was fully prepared to refute them. The patient, when taken to the Salpêtrière, could not know what would happen to him there, or in what way he would be treated; a counter-experiment was then tried, and there is no reason whatever to accuse him of simulation. The patient, who never had any attacks except the one mentioned, could not be placed on a level with hysterical women who were accustomed to practise simulation. M. Debove also reminded the assembled members of the Society, that M. Proust, of the Lariboisière Hospital, treated a similar case in the same way, obtaining the same results, only with the exception that the amelioration did not last beyond twenty-four hours; at the end of which time the patient had relapsed into his old condition of hemianæsthesia, on the same side as before. The difference between both cases is very tangible; in one case the sensibility is lastingly restored, and in the other only temporarily. It is to be noticed that neither of the patients presented the phenomenon which generally occurs in hysteria, viz., the transfer

of the anæsthesia from the affected part to the opposite one, after the application of the magnet.—*British Med. Journal*, Feb. 22, 1879.

### Laryngeal Consumption.

In a very excellent and most industrious monograph (Leipzig, Veit & Co., 1879), intended to contribute to the solution of the question, whether *tuberculosis* of the mucous membrane of the larynx and trachea is identical with *consumption* of these parts, or whether the latter disease is but a consequence and further development of catarrhal and inflammatory processes within the air-passages, HEINZE has collected very careful statistics, and reported very accurate microscopical examinations of a large number of specimens of this disease, his observations being based upon not less than 475 cases, which were dissected in the P. M. room of the University of Leipzig within a period of nine years. He begins by contrasting the views of *all* authorities on the question, who differ wonderfully in their opinions from each other, and then passes over to his own observations. Space unfortunately does not allow us to quote more than a few of the important results he has obtained, but we take this opportunity to recommend strongly the perusal of the pamphlet to all readers interested in the question. Amongst the most important conclusions, in a statistical point of view, are the following: Ulcerations within the larynx were observed in 30.6 per cent., within the trachea in 8.0 per cent. of all the cases of phthisis observed. Men are more frequently attacked than women. Ulcerations within the larynx are *very* rare in other diseases than in phthisis (syphilis, diphtheria, croup excepted). The organs more frequently affected besides the lungs in pulmonary phthisis are the intestines (51.3 per cent.), after that the larynx (30.6 per cent.). Ulcerations of larynx and trachea in pulmonary phthisis are more frequently met with in patients between 21 and 30 years of age. They are extremely rare in childhood. There is no certain predisposition to *laryngeal* phthisis in consequence of the patient's occupations; but as a rule, those classes fall ill most frequently with laryngeal affection who are also mostly predisposed for *pulmonary* phthisis. The next part is devoted to the Pathology of the disease: *In 94 per cent. of all the cases examined, there were either tubercular processes in larynx and trachea simultaneously, or in either of them alone; in 60 only the tubercular origin of the ulcer could not be demonstrated.* Tubercular infiltration was met with in 52.5 per cent. of all cases examined (most frequently on the ventricular bands and ary-epiglottic folds, further—in descendent line—on the mucous membrane of the arytenoid cartilages, vocal cords, epiglottis). Tubercular *ulcers* were found most frequently on the vocal cords (in 51 per cent.); further—in descending line—on the epiglottis (in 53 per cent.); in the trachea (also in 53 per cent.); on the arytenoid cartilages (in 46.9 per cent.); on the ventricular bands (in 28.5 per cent.); in Morgagni's ventricles, and on the inner surface of the cricoid cartilage (in 24 per cent. together). There is no connection between these ulcers and cavities in the lungs. Next, the microscopical changes, into the description of which we cannot enter here, are considered (the illustrations which accompany the description are very instructive); and finally, Heinze comes to the conclusion, that although there *may* be found *non-tubercular* ulcers in cases of pulmonary phthisis, their existence is quite accidental and unimportant, whilst the *large destructions of the larynx, which hitherto have been called with the common name of "laryngeal consumption,"* are *exclusively* due to *tuberculosis of the mucous membrane of the larynx*. In the last chapter, which treats of the Pathogenesis and Etiology of the disease, the author comes to the following conclusions: 1. A *primary* tuberculosis of the larynx most probably does not exist. 2. It is *not* possible to conclude from the laryngoscopic appearance of an ulcer *alone*, whether its nature is tubercular or

not. 3. A cure of the laryngeal tuberculosis will most probably never be obtained. With regard to No. 2, he says, however; that (a) the situation of the ulcers on the epiglottis, ventricular bands, in the ventricles, etc., (b) the simultaneous existence of ulcers on several of these places, (c) the intensity, depth, and extension of the ulceration, (d) its duration and incurability, will often permit us to diagnose with a great deal of probability, the tubercular nature of the process, without having recourse to examination of the lungs, etc.—*London Med. Record*, Jan. 15, 1879.

### *Syphilitic Affections of the Larynx.*

In the first part of a contribution to the study of respiratory troubles in syphilitic disease of the larynx (*Annales des Maladies de l'Oreille, du Larynx, et des Organes connexes*, September, 1878), M. KRISHABER begins by alluding to the period of the disease at which laryngeal affections appear, and is of opinion that it is impossible to assign a limit to the time at which they may develop. According to an analysis of cases made by himself and Mauriac at the Hôpital Midi, the earlier syphilitic eruptions of the larynx appeared from two to six months after the primary sore; only once was the interval so great as ten months. The later affections are frequently met with after an interval of perfect health, long after infection, generally about four or five years, but also ten or fifteen, and even much later than this. Sometimes, many years after infection a simple erythema occurs, whose specific character is only revealed by the subsequent appearance of grave symptoms. What seems to be a simple laryngeal catarrh, some time after contamination, may give rise to œdema endangering life; and it is most important to remember that œdema may complicate all forms of syphilitic laryngeal disease, whether recent or of older date. Any laryngeal trouble in a syphilitic subject, though only seeming due to a cold, should be treated as of grave import.

Syphilitic vegetations form most frequently without œdema. They grow very slowly, and attack, in order of frequency, the true vocal cords, the false vocal cords, the subglottic mucous membrane, and lastly, any other part of the laryngo-tracheal cavity. The lesions consist of a kind of membranous prolapse at the level of the vocal cords, arising sometimes from one or other surface, and forming a sort of diaphragm which tends finally to bring about complete obstruction. Sometimes true polypoid vegetations occur. It is easy to distinguish syphilitic from simple polypi, as the latter form in a healthy organ, whereas the former are only consecutive to previous lesions, generally ulcerative. There is no clear local sign of distinction between syphilitic and cancerous or tuberculous growths; the diagnosis must be made from other facts connected with the case.

Another form of syphilitic narrowing is caused by the cicatricial contraction of the tissues after loss of substance from deep and extensive ulceration; but when the mucous membrane only is affected, it recovers wonderfully under specific treatment, and it is sometimes scarcely possible to find any trace of the lesion afterwards. Although the acute stenoses are promptly influenced by treatment, the author has never seen the chronic form regress under any kind of medication.

The chronic stenoses are divided into three classes, as follows:—

1. Where the glottis is obliterated, and respiration is carried on through the tracheal canula; voice abolished.

2. *Inspiratory stenosis*.—Patients are unable to inspire sufficient air, but can expire enough to cause sonorous vibrations of the vocal cords, if these be not too much implicated; hence there is some degree of voice. Such patients also require tracheotomy.

3. *Incomplete laryngo-stenosis*.—Tracheotomy has been avoided. The lesion is arrested, but no improvement occurs. The patients breathe sufficiently to live,



if kept quiet, and no complication arise. They may enjoy fair health. The voice is more or less normal.

In these cases wheezing or whistling breathing (*bruit de cornage*) is not in direct relation to the intensity of the lesion.

The *prognosis* of syphilitic laryngo-stenoses is arrived at especially by noticing the evolution of respiratory symptoms. If these come on slowly, they constantly indicate insidious organic disease leading to a serious result. If, on the contrary, disorders of respiration occur rapidly, they indicate a state of imminent danger; but one capable of being promptly relieved by energetic treatment. Syphilitic lesions are generally more grave in the trachea than in the larynx, and laryngeal lesions are of more serious import in the subglottic portion than when situated above the vocal cords. Œdema appears to happen most frequently after a chill. Krishaber thinks it well to consider most cases of œdema in non-tuberculous persons as being syphilitic, whether cold be or be not assigned as the cause; and calls attention to the fact that œdema of the larynx is rare apart from any diathesis, while in diathetic affections it is the reverse. Therefore, bearing in mind the possibility of relieving syphilitic œdema by general treatment, and without any operation, it is rational to admit the presumption of syphilis, and to act accordingly, although the diagnosis be uncertain.

The *treatment* recommended to prevent relapse, which is always so likely to occur, is as follows: Once the cure obtained, the patient is to be left without treatment for an entire month. Afterwards, during the first eight days of each month, a teaspoonful of Van Swieten's solution (solution of perchloride of mercury), and during the last eight days of each month a gramme (15 grains) of iodide of potassium. This treatment is to be continued for about a year, for it has been abundantly proved that a patient who has had laryngeal symptoms, however slight, is liable to relapse under the most severe form, after premature cessation of treatment. The author concludes this part of his paper by giving reports of five cases, showing how tracheotomy may be avoided in some of the most urgent cases of laryngeal syphilis, provided the affection be recognized, and active general treatment promptly carried out.

CASE I. was one of acute laryngo-stenosis, without œdema (which is rare), due to a syphilitic tumour of the thyroid cartilage causing displacement of the whole larynx. The tumour disappeared under active treatment, and without tracheotomy, although the patient was almost asphyxiated when first seen.

CASE II. was that of a patient, aged 45, with multiple erosions and œdema of the larynx. The patient, though improving under treatment, neglected to attend. When next seen, the difficulty of breathing was so great that tracheotomy was proposed. The patient, however, refused to submit to the operation, and quite recovered under the active administration of mercury and iodide of potassium.

CASES III. and IV. also illustrate the good effects of active treatment; both were extremely severe, one having been sent for immediate tracheotomy.

CASE V. was that of a patient aged 42, sent to M. Krishaber for tracheotomy on account of extreme difficulty of breathing. The laryngoscope showed inflammatory œdematous swelling of the epiglottis, and false vocal cords, and œdema below the glottis. Under active mixed treatment, respiration became normal in fourteen days. Nitrate of silver was also applied locally, but did not seem to have any good effect.—*London Med. Record*, Dec. 15, 1878.

#### *The Treatment of Diphtheria.*

Professor KLEBS. of Prague, describes in the *Med.-Chir. Centralblatt*, No. 22, a series of experiments performed on himself and other persons to test the efficacy of benzoate of soda in destroying the formation of microscopic fungi in

the body. He has found that it procured relief in several cases of gastric catarrh, and other diseases, which are often noticed in persons who work a great deal among decomposed organic substances. In order, however, to be quite certain of the antiseptic or antimycetic power of this drug, it was necessary to find out whether, when introduced into the body of a healthy animal, it would enable it to resist infection. Diphtheritic membranes were accordingly soaked for some time in Buchholz's solution; then mixed with benzoate of soda, and inoculated upon the surface of several healthy animals, of which some had previously received a hypodermic injection of the above mentioned substance. It was then shown that, in those animals which had had the injection, the diphtheritic membrane was destroyed in ten minutes, whilst it still could be seen in the eyes of the others two hours after the operation. Klebs has administered benzoate of soda in doses varying from five grammes to his patients, who never experienced the least inconvenience from it.—*British Med. Journal*, Dec. 21, 1878.

#### *Use of Chloral in Diphtheria.*

Dr. ROKITANSKY (*Medicinisch-Chirurgische Randschau*, Nov., 1878) has used a 50 per cent. solution of chloral in three cases of diphtheria which had resisted the usual remedies, such as salicylic acid, carbolic acid, etc., and every time with the same results. The solution was applied every half hour with a camel's hair brush, and caused very little pain, except in one case where the tongue was thickly covered with a layer of diphtheritic matter; here a very considerable secretion of saliva was always observed immediately after the application, and the pain ceased entirely after a few moments. In the other two patients, in whom both tonsils were partly covered with the diphtheritic membrane, the pain was insignificant.

After the solution had been applied three times, *i. e.*, one hour and a half after the first application, large pieces of the membrane could be easily removed with the brush. The underlying portion of the mucous membrane was red and covered with fine granulations. As soon as the normal tissue could be seen, weaker solutions of chloral were gradually used during a week, at the end of which the patients had entirely recovered.—*London Med. Record*, Dec. 15, 1878.

#### *Pleuritic Effusion in which the Left Thorax was drained by a fine Canula and Capillary Tube.*

At a late meeting of the Clinical Society of London (*Med. Times and Gazette*, Feb. 1, 1879) Dr. SOUTHEY read the notes of the case of a carman, aged 23, of average build, height, and weight, who was admitted into St. Bartholomew's Hospital with the ordinary symptoms of pleurisy with effusion upon the left side, of about nine days' duration. He kept to his work until the day before admission to the hospital, and walked up stairs to his ward. On admission his temperature was 102.2°, respiration 24, pulse 80; cough was slight, and the usual symptoms of feverishness. There was absolute dulness of the left lung in front and laterally, and posteriorly as high as the root of the lung, general absence of respiratory sounds on the left side, and increased breathing of the right lung. The patient was ordered an effervescing draught of tartrate of soda with ten grains of nitrate of potash and ten minims of tincture of digitalis every four hours; and a draught containing one-sixth of a grain of morphia at bedtime, if required for sleeplessness or pain. On the second day after admission the feverish symptoms were scarcely changed, the nights were restless, there was frequent cough, and the urine scarcely averaged twenty ounces per diem. The dulness over the left lung extended higher up posteriorly. On the following day one of Dr. Southey's

first canulæ was introduced into the left pleural cavity in the fifth intercostal space in the mid-axillary perpendicular. Clear serous fluid escaped, and was conducted by a capillary drainage-tube to a jar beneath the bed. The man fainted directly the tube was introduced. It remained *in situ* for twenty-eight hours, hurting a little, and was then removed. Four pints of pleuritic fluid, specific gravity 1020, were drained away. The left side was then less dull on percussion; a loud friction rub was audible in front and behind, and bronchial breathing in front, at the side, and behind. There were thus abundant signs of lung-expansion. On the night after the operation the lad had a morphia draught, and slept well, and in the first twenty-four hours passed two pints and a half of urine of specific gravity 1019. The next day the same quantity passed, and on the following day as much as five pints and three-quarters, of specific gravity 1022. The daily quantity of urine during the next ten days varied from forty-five to seventy-five ounces. The saline mixture with digitalis was continued, and full diet with four ounces of wine was given. The temperature gradually fell until it reached the normal range on the fourteenth day after the operation, when the respiratory sounds of the affected lung were all still improving. He left the hospital on the thirty-second day after operation; the left shoulder was then slightly dropped. The percussion-note was good at apex, front, as low as the fifth rib, the axilla, and to the angle of the scapula behind; there was dulness over a hand's breadth at the base of the lung laterally and behind. A rough leathery friction sound was audible in the left supra-scapular, intrascapular, axillary, lateral, and infra-mammary regions. The cardiac sounds were normal. Dr. Southey remarked that not a tinge of blood came at any time through the canula; that the side had not been emptied, but simply relieved; and that the renal secretion immediately more than doubled. He had now tapped the chest five times in this manner, once drawing off nearly twenty ounces of purulent fluid, without any complication or accident, and he commended the proceeding for adoption in the hydrothorax of scarlatinal dropsy, as well as in any pleuritic effusion when the temperature remained high and the urine became progressively scantier day by day. Dr. Southey exhibited the last and best form of his fine drainage trocar and canula, suitable for paracentesis abdominis or thoracis, or the draining of anasarcaous legs. The trocar would adapt itself to different lengths of canula by means of a crochet-needle screw holder. The instrument would hold two sets or sizes of trocars and canulæ. A fixed shield was adapted to it, and held the canula *in situ* when it was used through the abdominal or thoracic walls. Dr. Southey had used the instrument in twenty or thirty cases of paracentesis abdominis without any untoward result. Messrs. Ferguson's foreman had gradually improved the instrument for Dr. Southey's trials, and it now seemed quite satisfactory.

In answer to a number of inquiries that were made, Mr. Southey said that adults fainted after the operation much more frequently than did children. The canula in his case was only running for twenty-four hours. An ordinary aspirator would draw off the fluid more rapidly, but was very apt to end by drawing off blood, which might or might not be prejudicial to the patient. His operation was a little longer, but more safe. Only a portion of the fluid, enough to relieve the pressure, was usually removed, and the remainder was left to nature. He had often heard the friction-sound produced after the withdrawal of a larger canula. Usually, however, it was only audible in front; but in this case it was heard in three situations, showing that the expansion of the lung had taken place in all three directions. The saline draught of nitrate of potash and digitalis had been continued from the first whilst the patient remained in hospital. The pulse fell from 100 to 60 and 50 beats in the minute, and the urine at the same time increased. He had often noticed the contemporaneity of the two events. He

should not employ that method of treatment if he knew that the fluid in the chest were purulent, though in one case, where the fluid turned out to be pus, he had drawn off a pint of it in six hours. As to the vocal sounds, there were vocal vibrations heard over the upper part of the lung, and ægophony was audible before and after the operation. No vocal vibrations were heard at the base of the lung; but there was dulness at the base even when the patient left the hospital. He had remained at work since then until now, with a small fistulous opening in the side, which still discharged a small quantity of fluid. He felt occasionally a little troubled; then a kind of boil would appear at the fistulous opening; this would open and discharge a little clear fluid, and the patient again became better. Usually there was not much chance of a fistulous opening resulting from this operation.

### — The Detection of Pyloric Insufficiency.

A method of diagnosing alterations in the structure of the pyloric orifice of the stomach, which render it incapable of complete closure, is described by Professor EBSTEIN, of Göttingen, in No. 155 of Volkmann's *Sammlung Klinischer Vorträge*.<sup>1</sup> The method is not new in principle but new in its diagnostic application, and it consists in artificially distending the stomach with carbonic acid gas. If the pylorus is able to contract naturally, this gas simply renders the contours of the stomach clearly visible through the abdominal wall, while on percussion a markedly tympanitic note is produced over the whole area of the stomach, which clearly defines it from the neighbouring intestinal tract. Supposing, however, the pylorus is incapable of complete closure, almost immediately after the stomach becomes dilated, the gas makes its way into the duodenum and thence into the bowel, giving rise to acute tympanites. The latter varies in degree in various sections of the intestine, while the distension of the gastric walls remains but slight, so that it is not always possible to mark out the stomach, either by inspection or percussion. Gaseous distension has been used by Dr. S. Fenwick in England, and by Frerichs and Heinrich Wagner in Germany, with the view of determining the boundaries of the stomach, but Professor Ebstein appears to be the first who has utilized it for the purpose above mentioned. Opinions have been rather divided as to the normal condition of pyloric contraction during digestion, and Professor Ebstein has himself undertaken some interesting experiments on animals, with a view to acquire some accurate knowledge on the subject. Four dogs and a cat were experimented on, and all the animals were narcotized and killed at the end of the experiment by the injection of chloroform into the trachea. The plan adopted was as follows: In three cases a solution of tartaric acid and then one of bicarbonate of soda was introduced into the stomach, and the upper end of the catheter was closed by a clamp. In the two others pure carbonic acid was forced into the stomach by the pressure of a short column of water. In all the cases one arm of a bent glass tube was tied into the commencement of the small intestine, and the other carried to the bottom of a vessel containing baryta water. In no case did the least cloudiness occur in this reagent so as to indicate the passage of any trace of gas through the pylorus. Care was also taken to make certain that there was no abrupt bend in the intestine to confine the gas, and that the duodenal catheter was quite permeable. The contraction of the pyloric muscles continued even until after death. In one case an incision through the longitudinal and circular fibres of the pylorus was made while the animal still lived, and it was not till the innermost circular fibres were divided that the stomach collapsed and the gas escaped. Professor Ebstein refrains from drawing too strict a con-

<sup>1</sup> "Ueber die Nichtschlussfähigkeit des Pylorus (*Incontinentia Pylori*)."

clusion as to the contraction of the pylorus in man from these experiments on the lower animals, but such clinical observations as he has as yet collected are all in favour of the view that a healthy human pylorus is able to prevent all escape of gas into the duodenum. In examining a patient by this method a teaspoonful of tartaric acid is given in a little lukewarm water, and this is immediately followed by a large teaspoonful of bicarbonate of soda similarly dissolved. In two cases of cancer of the stomach (and it is mainly with this affection that the symptom of pyloric insufficiency is combined), the diagnosis made *intra vitam* by this method was completely confirmed. In one case the cancerous mass gave rise to a semicircular chink large enough to allow the forefinger to pass through it; and in the other a large ulcer, which extended deep into the left lobe of the liver, had destroyed as much of the pyloric ring as would admit two fingers. In five out of six other cases of pyloric insufficiency, without necropsy, the other clinical signs enabled an almost certain diagnosis of cancer of the stomach to be made. In the sixth case there were strong grounds for a similar diagnosis, as neither ulcer of the stomach nor any other organic changes, which in the absence of cancer would explain the great emaciation, vomiting, and severe dyspeptic symptoms, could be detected. Professor Ebstein, however, distinctly admits that the existence of incomplete closure of the pylorus is not necessarily connected with cancerous changes, or that we are as yet able to draw from this symptom an accurate conclusion as to the form of disease. A simple ulcer may impair the function of the pyloric muscles, and very probably pyloric insufficiency may, in some cases, have a nervous origin; for example, in hysteria, where the tympanites of the intestine can be explained by the immediate passage of the air which such patients swallow, from the stomach into the bowel. The majority of cases will, however, probably be cancerous; and further, if in a given instance the diagnosis of cancer of the stomach can be definitely made, and the carbonic acid test reveals pyloric insufficiency, Professor Ebstein believes (and probably no greater authority on cancer of the stomach exists) that even if vomiting is absent the seat of the disease may, with great probability, be assigned to the pylorus. In conclusion, he points out that this method, assisted by careful post-mortem examination of the pyloric region, may help to clear up some of the obscurer symptoms of diseases of the stomach. It may be used without fear either of distressing the patient or of enlightening him as to the character of his malady.

Thus says Professor Ebstein: but we have some hesitation in accepting this dictum. The intense and overpowering distress sometimes occasioned by overdistension of the stomach with air or gas of any kind is unfortunately too well known to many. Not only are the movements of the diaphragm and that of respiration interfered with, but the movements of the heart, both directly and through the celiac plexus, are also impeded. Such a degree of oppression is thus produced, that it is not an uncommon factor in the immediate cause of death in certain forms of disease.—*Med. Times and Gaz.*, Feb. 1, 1879.

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#### *Citrate of Caffein as a Diuretic in Cardiac Dropsy.*

Prof. Gubler has drawn attention to the special property of citrate of caffein of inducing abundant and instantaneous diuresis in cases of cardiac dropsy. Dr. LEWIS SHAFER (*Practitioner*, Jan. 1879) has confirmed this observation, and finds that the caffein, in doses of from gr. iij to gr. vj, is a diuretic and cardiac stimulant of great value in such cases of cardiac dropsy where a dilated, feeble, and irregularly contracting heart undergoing progressive mural decay is the main clinical and pathological element to be contended against.

*Periodic Hæmoglobinuria.*

Among the diseased conditions which the improved methods of observation have brought to light of late years, perhaps none is better characterized than that which was first described in England by Dr. Pavy as "paroxysmal hæmaturia," and which has also more recently been called "intermittent hæmatinuria," and in Germany "periodic hæmoglobinuria." The number of cases recorded is not large; most of them are English, six German, and only two French; but there is a striking resemblance between all of them. After exposure to cold the patient shivers, suffers from peculiar sensations in the loins and extremities, becomes febrile, and passes dark-coloured urine, highly albuminous, often containing hyaline casts but no blood-corpuscles, although oxyhæmoglobin can be detected by spectrum analysis. At the same time the skin becomes sallow, the conjunctivæ perhaps icteric, and the patient feels weak and depressed. Tenderness in the renal region is a common system, but the functions of all the other organs of the body may be normal. The temperature at the onset of an attack may reach 40° Cent. (104° Fahr.), or in the milder paroxysms may be little raised. We do not intend here to occupy more space with the details of individual cases, which can be found in Dr. Legg's paper (*St. Bartholomew's Hospital Reports*, vol. x.), in Professor Lichtheim's recent lecture (*Vollmann's Sammlung*, No. 134), or in the paper of Drs. Kobert and Kuessner (*Berliner Klinische Wochenschrift*, No. 43, 1878). A far more interesting subject of discussion is the source of the hæmatinuria. Is it due to a renal congestion, to an alteration of extravasated blood by oxalates in the bladder itself (Van Rossem), or to dissolution of the red corpuscles within the circulation at large? Let us consider the third hypothesis first, and, calling to mind the numerous experiments which have been made of late years on the transfusion of the blood of one animal into the circulation of another (see, for example, *Medical Times and Gazette*, vol. ii. 1874, pages 263, 689), let us compare the symptoms observed in these experiments with those met with in periodic hæmoglobinuria. They are very nearly identical. There is common to both the shiver, the transient fever, the lumbar uneasiness and pain, and the hæmatinuria, and the parallel has been rendered still closer by the occurrence of urticaria, a tolerably common sequela of "heterogeneous" transfusion, in a patient of Dr. Lichtheim's (*loc. cit.*, page 2) with periodic hæmoglobinuria.

Now, it has been proved by Landois and Ponfick that the red blood-corpuscles of one animal transfused into the circulation of an animal of another species undergo a gradual process of disintegration and solution, in which the colouring matter of the blood passes into the serum, and thence through the walls of the renal vessels into the urine. Hence we are justified in assuming that in hæmoglobinuria proper, a solution of the corpuscles of the patient's own blood takes place. Can we, however, go further, and explain the alteration in the quality of the serum on which the disintegration of the corpuscles depends? It is certainly known that chemico-physical changes—extreme dilution of the serum by water and by glycerine, the injection of saponified bile acids, the inhalation of certain poisonous gases, severe febrile diseases, and lastly, extensive burns of the skin—are attended, with more or less constancy, by hæmoglobinuria, the origin of which in solution of the red blood-corpuscles has been proved in the case of burns by Max Schultze, Werthheim, and Ponfick.

Further than this we cannot at present go. We can only conjecture that as the disease before us is invariably excited by exposure to cold, some poisonous excretion from the surface of the skin is prevented escaping by the sudden contraction of the cutaneous vessels, and thrown back into the circulation. It is not

experimentally found that even severe cooling of the skin (in rabbits) produces hæmatinuria; so that cold *per se* may be excluded as the cause of corpuscular solution. The examination of the various organs of the body, especially those supposed to be mainly engaged in the formation of the blood—the liver and spleen—has as yet given negative results. The kidneys are probably only secondarily involved, as the passage of hæmoglobin through them in large quantities has been found experimentally (Ponfick) to injure their secreting apparatus; and even if sufficiently prolonged, to cause death by the pathological changes it induces in them. The icteric tint of conjunctiva so commonly noticed within the first few days of the attack is not dependent on bile pigment in the blood. A form of hæmoglobinuria of rapid onset, and sometimes fatal, has been described by Professor Bottinger (*Deutsche Zeitschrift für Thiermedizin*, Bd. III., 1877) in horses. The general symptoms, however, are different from those of human periodic hæmoglobinuria, and the reason for alluding to it here is the fact that sudden exposure to cold after several days' rest in a warm stable is invariably the exciting cause. The chief post-mortem change is renal disease similar to that produced by experimental hæmoglobinuria.

The curious immunity of the female sex in man from this disease throws no light at present on the true causation. It would, however, be interesting to know whether the same immunity prevails in horses.

After what has been written above, we need scarcely again refer to the hypothesis of renal congestion and vesical solution spoken of earlier in this article. Van Rossem's view, that oxalates cause disintegration of blood effused with the urine into the bladder, falls to the ground at once when it is found that oxalates are often absent in these cases, and that the presence even of a very few red blood-cells or their *débris* in the urine is extremely rare.

The prognosis of hæmatinuria is, according to Lichtheim, to whose excellent monograph we are largely indebted for the materials of this article, probably less favourable than English observers are inclined to regard it. Though no fatal case has as yet been recorded, the chances of complete recovery seem to be very doubtful. Lichtheim has watched a case for five years, and the attacks continue as they did at first. But we are perhaps justified in assuming that repeated fits of hæmatinuria will cause a more and more extensive disorganization of the kidneys. The main element of rational treatment appears to be the avoidance of all causes of chill; if possible, the removal to a mild and temperate climate; warmth and rest in bed during the paroxysm; and the exhibition of iron in some one of its multitudinous forms when the pyrexia has subsided.—*Med. Times and Gazette*, Feb. 15, 1879.

#### *On the Use of Vaseline and Unguentum Vaselini Plumbicum in Skin Disease.*

Prof. KAPOSI (*Wiener Med. Wochenschrift*, No. 17, 1878), after stating that all emollient substances hitherto used in diseases of the skin, where the epidermis is removed or the surface is sensitive, as various fatty substances, oils, lard, glycerine, and glycerine of starch, are more or less irritating in most cases, refers to the bland and non-irritating properties of vaseline or petroleum jelly (with this also may be classed ozokerin and unguentum petrolei). These have no tendency to become rancid, and are useful in softening and removing crusts and scales, as in cases of eczema squamosum when the surface is dry and desquamating. He introduces an ointment which promises to prove of great value. This is a modification of Hebra's well-known unguentum diachyli, which is seldom met with properly prepared except at Vienna. This ointment, for which Kaposi proposes the name of unguentum vaselini plumbicum, is made by dissolving and incorporating thoroughly by aid of heat equal parts of lead plaster and vaseline, to which a

little oil of bergamot may be added to scent. It causes no burning sensation on excoriated parts, and is especially available in eczema. It is admitted by Kaposi that the original unguentum diachyli gave rise to unpleasant heat and even acute exacerbations of the eczema, due, he believes, to an evolution of fatty acids from the oil during boiling, and to an imperfect saponification of the oxide of lead.—*Edinburgh Med. Journ.*, Dec. 1878. [This preparation was originally recommended by Dr. H. G. Piffard, of New York (*Archives of Dermatology*, July, 1876), who had used it successfully in the treatment of eczema.—ED.]

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## SURGERY.

### *Case of Extirpation of the Larynx.*

Dr. VON BRUNS relates (*Wiener Medizinische Presse*, November 17th, 1878) the case of a shoemaker, aged 54, who in 1873 began to suffer from pain in his windpipe; this gradually assumed a sharp burning character, and was accompanied by dysphagia, dyspnoea, paroxysms of coughing, and almost complete loss of voice. When he first came under notice, January 3d, 1878, the breathing was laboured and whistling, the voice could be hardly described as an intelligible whisper. Acute bronchial catarrh was present, and the man could take but little nourishment. An examination with the laryngoscope revealed the presence of an obstructing epithelial carcinoma, in a state of ulceration, filling the whole lumen of the larynx, with the exception of a small irregular opening, through which the air passed. The carcinomatous nature of the tumour was verified by the microscope. After some consideration it was decided that excision of the whole larynx afforded the patient the best chance of recovery, and, on the 29th of January, the operation was undertaken. Tracheotomy was not performed at the commencement, and the larynx was taken out from below upwards instead of from above downwards. As incision was made from the lower jaw to the sternum in the median line, and the deep dissection continued until the hyoid bone, the thyro-hyoid ligament, the thyroid cartilage, and the upper rings of the trachea, were laid bare. The perichondrium of the thyroid cartilage was raised as far as the cornua, and the neighbouring muscles reflected; the same steps were taken with regard to the cricoid cartilage, and so the entire larynx was fully exposed. The trachea was next opened at its upper rings, and Trendelenburg's tampon inserted. After this the larynx was pulled forward by means of hooks, and dissected out. There was no very great amount of bleeding. The operation occupied forty-five minutes. The patient was in a state of collapse when first placed in bed; this was followed by high fever lasting a week. On the 1st of February an ordinary tracheotomy tube was inserted into the windpipe. A fortnight after the operation this was replaced by a thick caoutchouc tube, the patient being able at this time to leave his bed with his general health much improved. In five weeks Gussenbauer's artificial larynx was tried, and with the aid of this instrument the man soon learnt to speak in an audible falsetto monotone.—*London Med. Record*, Jan. 15, 1879.

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### *Excision of Thyroid Gland.*

At a meeting of the Imperial Medical Society in Vienna, January 30, Dr. Wölfler showed a woman, aged 35, whose entire thyroid body had been removed by Professor BILLROTH for dyspnoea, caused by a tumour of the gland the size



of a large apple. The operation was performed according to the method recommended by Dr. P. H. Watson, the capsule of the gland being left intact, until the bloodvessels had been ligatured *in situ*. The bleeding was very slight. Antiseptic precautions were taken throughout, and on the ninth day the dressings were found to be unnecessary. The weight of the extirpated gland was 50 grammes. This is the twelfth patient from whom Professor Billroth has successfully removed the thyroid body, the size of the tumours varying from a hen's egg to that of a child's head. The average time taken for healing to be accomplished in these cases was seventeen days.—*London Medical Record*, Feb. 15, 1879.

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#### *Case of Excision of the Spleen.*

Dr. W. C. ARNISON records (*British Med. Journal*, Nov. 16, 1879) the following case of excision of the spleen :—

T. K., aged 37, was admitted on August 29, 1878, into the Newcastle-upon-Tyne Infirmary. He was a healthy man until last autumn, when he received a blow in the left side, below the ribs, since which he suffered pain, and his health failed. A few months ago, he noticed a hard tumour in the left side, which grew larger. His family history was good, and he had been a fairly sober man. He never had ague, nor had he been in ague districts.

The left side of the belly, from about an inch below the nipple to the crest of the ilium and to the median line in front, was entirely filled by the spleen; its surface was smooth, and it could be moved by pressure on its posterior border to the left of the spine. Ascitic fluid occupied the abdominal cavity, and was interposed between the spleen and the abdominal wall. The patient was of fair complexion, of waxy pallor, emaciated, and the microscope showed the presence of leucocythæmia. His appetite was fairly good. He had occasional diarrhœa. After consultation with his colleagues, it was decided to excise the spleen on the 29th of September.

Chloroform having been administered, an incision was made in the median line, extending about two inches on each side of the umbilicus. Dr. A. then passed his hand round the spleen, and found it free from adhesions; the incision was then enlarged, and the rectus muscle cut across, the artery being held and secured before the transverse incision was carried through the peritoneum. The diaphragmatic and capsular connections were carefully torn through, and the spleen then easily turned out; it was held up while the vessels, which were considerably enlarged, were tied with three whipcord ligatures; two large sponges were then held round the pedicle, which was divided, and the spleen removed. Much difficulty was now experienced in finding and securing one or two bleeding points, which seemed to be in the torn peritoneal connections, and were, of course, very deep. They were at last secured, the belly carefully sponged out, and the wound closed by interrupted sutures. The operation was conducted antiseptically, and occupied seventy minutes, the greater part of that time being spent in securing the bleeding points.

The patient was placed in bed with a pulse of 98, and of fair strength. On recovering from chloroform, he complained of severe abdominal pain, which was relieved by injecting one-fifth of a grain of morphia; but he never seemed to rally from the shock. About four hours after the operation, Mr. Dixon, Senior House-Surgeon, transfused by gravitation two ounces of milk freshly drawn, provision having been made for this in anticipation that it might be required. No more milk would flow into the vein. The pulse rose for a few minutes, but quickly fell, and death occurred five hours after the operation.

The symptoms pointed to shock rather than to bleeding as the cause of death ; but the body was removed before this supposition could be verified by *post-mortem* examination.

The spleen weighed 7 lbs. 13 oz. After its removal, ten ounces of blood drained out of it.

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*Case in which a Testicle congenitally displaced into the Perineum was  
successfully transferred to the Scrotum.*

Mr. THOMAS ANNANDALE, Professor of Clinical Surgery in the University of Edinburgh, reports (*British Med. Journal*, Jan. 4, 1879) the following case of this rare congenital affection of the testicle, in which, so far as we can ascertain, for the first time, the displaced testicle has been successfully transferred by operation and permanently retained in the scrotum.

On the 15th of June, 1877, Dr. Irvine of Pitlochry recommended to my care a male child, aged 3, who had been brought to him suffering from pain in the region of the perineum, which was much aggravated when the little patient was allowed to walk or run. It was noticed that some abnormality existed in connection with the right testicle shortly after birth, but it was only when the child began to walk that the pain directed special attention to the part. Dr. Irvine, finding that the cause of the pain was a displacement of the right testicle, asked me to admit the child into my wards, with the hope that something might be done to relieve the symptoms.

An examination of the patient showed that the right side of the scrotum was empty, but its skin and other tissues were well-developed. On searching for the cord, it was felt to come out through the external abdominal ring in the usual way, but, instead of passing down into the scrotum, it could be traced to the perineum, where the right testicle lay. This displaced testicle was felt to be well-developed, was of the usual size, and was lying under the skin and cellular tissue at a point a little to the right side of the middle line of the perineum. It was situated at a little lower level than if it had occupied its usual place in the scrotum. When pressure was made over the testicle, it caused much pain. The left testicle was normal in situation and development.

On the 5th of July, I performed the following operation, with a view of transferring the displaced testicle to its proper position in the scrotum. An incision, commencing over the external abdominal ring and extending half way down the scrotum, was made on the right side, so as to expose the cord, which was then seized, and by means of it the testicle was drawn out from its abnormal position. This was not done without the division of some adhesions, and there was one fibrous band attached to the bottom of the testicle above and to the tuberosity of the ischium below, which appeared to correspond to one process of the gubernaculum testis, and which required to be cut across before the testicle would leave the perineum. The scrotum was now opened up more freely, and the drawn-out testicle was placed in it and securely fixed there by means of a catgut stitch passed through the bottom of the scrotum and lower part of the testicle. The opening into the perineum along which the cord and testicle had passed was subcutaneously stitched with catgut, and a small counter-opening made at the most dependent point of the perineal cavity which had contained the testicle, so as to allow any fluid to drain away and insure the complete closure of the cavity and prevent the testicle from passing again into it. The wound in the scrotum and groin having been stitched, antiseptic dressing was applied. The whole of the operation was performed antiseptically.

The patient's progress after the operation was satisfactory in every way, and the wounds were healed on the 31st of July. A few days afterwards, he returned

home with his testicle securely resting in the scrotum in a perfectly natural manner.

In November of the same year, Dr. Robert Irvine was kind enough to write me that he had recently examined the boy, and had found both testicles in the scrotum, and occupying much the same position on their respective sides; the only difference between the two being that the right one felt a little smaller and harder, was more deeply situated, and somewhat more fixed than the left one.

Mr. Curling, in his very valuable work *On Diseases of the Testis*, relates a case very similar to the one just reported, in which he endeavoured to replace and retain the testicle in the scrotum, but he did not succeed in doing so, owing, he thinks, to "the cremaster retracting the organ after the separation of the adhesions which retained it, as the cord was quite long enough to admit of its removal to the intended site." Mr. Curling further remarks: "In another operation, I should endeavour to secure the testicle to the bottom of the scrotum with a suture." The employment of the subcutaneous catgut suture so as to close completely the perineal cavity, in addition to stitching the testicle to the bottom of the scrotum, as suggested by Mr. Curling, insured, I consider, the success of my operation, and I would, therefore, advocate this proceeding in every similar case.

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#### *An Improvement in the Treatment of Epididymitis.*

In a paper contributed to the *Allgemeine Wiener Med. Zeitung*, Nov. 12, 1878), Prof. ZEISSL, of Vienna, gives an account of the results of the trials he has made of the treatment of this affection pursued by M. Horand, of Lyons.

As to the statistics of the affection, he observes that of 2055 men suffering from gonorrhœa who have come under his care at the hospital during the last eight years, 696 have been attacked by epididymitis, 368 suffering from it on the right side, 302 on the left side, and 26 on both sides. The mode of treating the affection during the last ten years has been the antiphlogistic, consisting in the application of leeches and cold compresses along the course of the cord to the perineum, and the employment of purgatives. Not only has the diet been more or less limited, but the patients have been confined to bed. The scrotum, exhibiting more or less erysipelatous redness with tumefaction, has been kept up constantly by means of a cushion, or raised upon the thighs by a cloth of a hand's breadth passed under it. It is also kept surrounded by a wet compress, over which is laid a small light bladder of ice. In many cases these means suffice in three or four weeks to relieve the tumefaction of the vas deferens of the epididymis, and the inflammatory conditions of the skin of the scrotum and the subscrotal tissue, and to allow of the restriction on diet being removed. Only in exceptional cases, and when the epididymitis has assumed the chronic form, may practitioners apply the unguentum hydrargyri cinereum in moderate quantities to the affected side of the scrotum, continuing the local employment of cold. Formerly many had great dread of the application of cold, under the idea that revulsion of the diseased process to the lungs might be induced, erroneously supposing that some fatal cases of hæmoptysis which have occurred were due to this application of cold. When the pain has been excessive, Prof. Zeissl has applied belladonna ointment (five parts of the extract of belladonna to fifty of simple ointment) spread upon linen or leather; or has had a portion, the size of a nut, rubbed into the diseased side of the scrotum, continuing the cold applications, and securing sufficient action of the bowels.

Although by following this method a very great number of cures of this affection were obtained, yet, owing to several inconveniences it gave rise to, other means of treatment were sought for. One of the earliest of these was that of

Frick, which consisted in submitting the testis to a regulated compression by means of strips of sticking-plaster. This, however, could only be applied after the excessive sensitiveness of the parts had subsided. Even then it required the greatest care, and Prof. Zeissl has repeatedly known gangrene of the integument of the scrotum follow its employment. Also, in other cases in which the compression had been too hastily applied, he has known wasting of the testis to follow. Simplification of the treatment of gonorrhœal epididymitis therefore continued a desideratum; and that the more so because the painful nature of the affection kept the patient entirely away from his employment, while the nature of the affection becoming known often operated mischievously against his interests. It therefore became very desirable to find some means which might at least partly relieve the pain and enable the patient to resume his employment. This seems to be the merit of Langlebert's method as described by Horand, surgeon to the Antiquaille at Lyons, in a work bearing the title "*Du Traitement de la Tumeur Blénorrhagique des Bourses par le Pansement Ouato-caoutchouté de Langlebert.*" In this accounts are given of 200 cases successfully treated; and the present paper furnishes the results of Professor Zeissl's trials with the apparatus in question. This consists of three parts—a layer of wadding of a sufficient degree of thickness, a square piece of caoutchouc cloth, and a suspensory. This last, triangular in shape, and slightly concave, has a hole at its upper edge through which the penis is passed. To its two upper corners are attached two long bands which serve to confine it around the abdomen; and the lower angle is also attached to two bands which surround the thighs, these last being connected with and fastened to the bandage which goes around the abdomen. The patient lying in the horizontal posture, raises the scrotum well enveloped by wadding as high as possible upon the symphysis pubis; and then the square piece of caoutchouc cloth is applied with its shining side towards the wadding, a circular hole having been made in its upper part for the passage of the penis. The suspensory is then put on, and firmly secured to the abdominal band. By this means the scrotum is kept up almost level with the upper edge of the pubes. Horand does not undo the bandage until the end of a week, and if he finds the swelling has not yet disappeared, he continues the procedure or applies a resolvent ointment or plaster.

Prof. Zeissl strongly recommends the procedure, having treated by it since October of this year fifty cases, either in private or hospital practice, and always with most excellent results. He relates a case to which he was called, in which the patient, who had passed five nights without sleep, was suffering fearful pains, every motion and the slightest contact with the testis giving him agony. The Langlebert apparatus was applied, and the patient desired to rise from his bed. This, from the intense pain he had suffered on before trying to do so, he did with great hesitation, but found that he could get up without the slightest suffering, and was able even to walk to and fro in the room. Prof. Zeissl states that he could cite several similar cases, and up to the present time he has never had, in any of the so treated cases, to prescribe anodyne ointments, or to puncture an acute hydrocele produced by the epididymitis. In most of the cases the pain ceased immediately on applying the bandage, or at the very least was so diminished as to allow the patient to pursue his employment. The practice is so simple and so cheap that it is especially suited for hospital practice, the bandage only having to be applied, and all the attendance formerly required, as the application of ice, etc., dispensed with. The suspensory used is far superior to that now commonly employed, there being none of the mischievous pressure from the elastic; while the scrotum is almost completely immobilized, and an exact application is secured by means of the wadding. A very moderate compression is exerted, and an abundant transpiration takes place at the surface of the scrotum.

In all these fifty cases the patients were able to walk about the room, and most of them to follow their employments.—*Med. Times and Gaz.*, Dec. 14, 1878.

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*The Diagnosis and Treatment of Ruptured Bladder.*

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, March 1, 1879), Mr. CHRISTOPHER HEATH read a paper on this subject, of which the following is an abstract:—

The author narrated a case from his own practice, in which rupture of the bladder had occurred forty hours before the patient came under his notice, and in which the lesion was diagnosed principally from the tense condition of the abdomen, from the fact that a catheter, on entering the bladder, drew off clear urine, but, on passing further, gave exit to bloody urine, which ebbed and flowed as the patient breathed, and that warm water injected through the catheter was felt in the groins and abdomen by the patient. Under ether the abdomen was opened, and the opening in the bladder closed with a continuous catgut suture. A catheter was tied in, and gave exit to clear urine till the fifth day, when it became bloody, and symptoms of peritonitis developed, the patient dying just six days after the accident. At the post-mortem examination the lower part of the bladder-wound was found open. Reference was made to Mr. Willett's case, in which a similar proceeding was adopted with a fatal result, and four recorded cases of recovery after rupture of the bladder into the peritoneum were then discussed. They were: 1. Mr. Chaldecott's case, treated by catheterism only; 2. Dr. Walton's case, treated by abdominal section for the removal of the urine; 3. Dr. Thorp's case, treated by catheterism of the peritoneum and washing out; 4. Dr. Mason's case, treated by lateral lithotomy. Having regard to the great difficulty of closing the bladder with stitches, which had now been tried in two cases without success, the author recommended in future cases a trial of the catheterism and washing out of the peritoneum as practised by Dr. Thorp, reserving lateral lithotomy for cases in which the rent in the bladder could not be reached with the catheter.

Mr. BRYANT said the paper was a valuable contribution to the special treatment of rupture of the bladder, associated or not with fracture of the pelvis. He agreed that if any good were to be expected from washing out the peritoneal cavity, it would be only where the operation was done very early after the injury, before any peritonitis had set in. Two things had to be done, viz., to find an outlet for the escape of the urine extravasated into the peritoneal cavity, and, secondly, to provide for the continuous evacuation of urine from the bladder. The first object was met by laparotomy, but the second would be far better attained by cystotomy through the perineum, as in lateral lithotomy. Mr. Heath's procedure of washing out the peritoneum was of value so far as it went, but it could only be in exceptional circumstances that a catheter could be passed through the urethra into the bladder and on through the rent in the bladder into the peritoneum. When this could be done it was an important step, and Mr. Bryant had seen three cases in which the peritoneal cavity was thus emptied of irritating urine. But, save in a few cases, to do this would require much harmful manipulation, and Mr. Heath would probably concur that it would not be wise to search too long for the rent, a search all the more difficult because it had to be made in the contracted bladder. The most important point being to give free vent to the contents of the bladder, a simple incision through the perineum would best effect this, and would allow of the natural closure of the rent in the wall. A case of lacerated wound of the bladder came under his care not long ago. It was a case of a boy of thirteen, who, becoming impaled on a railing-spike, which

entered the right side of the perineum in front of the tuberosity, and, as the boy fell backwards, the rectum and base of the bladder were extensively lacerated. Mr. Bryant saw him at once, and, in addition to the injury to the soft parts, found a lacerated wound in the rectum, through which he could introduce a finger into the bladder. He made a free section into the bladder through the prostate, and thus allowed an escape for urine, to which he believed the lad's eventual recovery was due. This was a case of laceration of the bladder at its base, but in cases of rupture of the bladder with fracture of the pelvis, where the anterior part was mostly involved, Mr. Bryant thought more active measures than were customary should be taken. In a case of fractured pelvis and lacerated urethra, where Mr. Bryant only made a free incision into the perineum, no urine escaped, and it was necessary to tap the bladder afterwards per rectum. On the patient's death the urethra was found to be torn completely across, the two portions being separated by at least two inches, and a large cavity containing urine had formed beneath the pelvic fascia. It would have been better to have extended the perineal incision into the bladder. He had post-mortem records of two similar cases, and he urged, therefore, that when the surgeon failed to give free enough vent by perineal section, he should greatly extend his incision; and whether the rupture be in the posterior or anterior part of the bladder, the principle was the same. He suggested that Mr. Heath's plan of washing out the peritoneum might be better effected after cystotomy had been performed.

Mr. HOLMES differed from the conclusion arrived at by Mr. Bryant, that the result of the cases of Messrs. Willett and Heath proved the unjustifiability of the operation. On the other hand, they seemed to be very encouraging for the repetition of this operation, if performed at a very early period. In both cases the fatal issue was distinctly due to the giving way of sutures, so that neither could be quoted against the probable efficacy of the operation. He could not understand why the urine would flow out of the perineal wound rather than through the rent in the bladder into the perineum; and if the cystotomy wound at any time closed it would determine the escape of urine into the peritoneum. But Mr. Bryant wished to supplement his proposal of cystotomy by the practice of washing out the peritoneum from above by a catheter introduced into the bladder. When the great extent of the peritoneum is considered it would seem impossible thoroughly to wash this out. He believed that when the wound in the bladder could be closed by sutures the chance of recovery was much heightened, and Mr. Heath's case showed the great improvement that took place until fresh extravasation ensued. Mr. Holmes then related the case of a man who for the first thirty-six hours after injury presented no symptoms of rupture of the bladder except retention of urine, and who suffered so little that he walked to the hospital, but in a short time died from peritonitis, and a large rent was found in the bladder, and a quantity of urine in the peritoneal cavity.

Mr. HEATH, in reply, said he did not exclude cystotomy, which indeed he held to be advisable when the peritoneum cannot be otherwise catheterized. It was most essential to wash out the peritoneum, and if this could not be done through a catheter in urethra and bladder, then it must be through the cystotomy wound. The question of diagnosis was extremely difficult. If this patient had not died, one of his (Mr. Heath's) colleagues would have remained sceptical as to the case being one of complete rupture. The points relied on by Mr. Heath were: (1) passage of catheter for its whole length, and its perfect freedom at its extremity; (2) the passage of clear urine on first introducing the catheter, and then of bloody fluid; (3) the impossibility of distending the bladder on injecting water. This he looked on as of most value, and pointed to another case where, in a few minutes, a great sense of distension was complained of, proving that the

viscus was not torn. The yielding of the suture in his case was due probably to the fact that it was a catgut suture, which he had perhaps cut off too close to the knot. He believed the peritoneum could be effectually washed out through the rent in the bladder, for in that way the whole peritoneal sac could be distended with water. He did not mean to say that he should not repeat the operation, but wished to enforce the fact that the unaided surgeon had far better rely upon free washing out and catheterism than attempt to treat a case of ruptured bladder by cystotomy or abdominal section. He could conceive of a cystotomy being done and attended with fatal result in a case where there was no rupture at all.

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*Ligature of the Common Carotid in Ulceration of the Internal Carotid Artery.*

At the meeting of the Surgical Society of Paris, on October 9, M. HERMANN (of Mulhouse) read a paper on ligature of the common carotid in cases of ulceration of the internal carotid. A patient with abscess of the tonsil had suddenly profuse hemorrhage. Happening to be in hospital at the time of the accident, M. Hermann was able, in spite of great swelling in the neck, to apply a ligature to the main artery. The patient recovered. M. Hermann considered that phlegmon of the tonsil could bring about ulceration of the large vessels; the internal carotid was more often affected, yet he cited observations where the bleeding came from the branches of the external carotid. In a great number of cases, ulceration of the wall of the artery was favoured by a bad state of health, or by an increase in the blood-supply, yet his case proved that it was not always so, as the phlegmon of the tonsil was the only cause of ulceration of the carotid. In these cases it was better to tie the common artery, as it was difficult to know the exact source of the bleeding, whether from the external or the internal carotid.

M. Tillaux thought it was very desirable to establish a correct diagnosis, as, if the blood came from the external carotid, ligature of the common artery would not stop the hemorrhage, as the anastomoses of the internal carotid would re-establish the circulation. A large supply of blood did not suffice as an argument, for under the influence of inflammation the vessels of the tonsil were largely developed.—*London Med. Record*, Dec. 15, 1878.

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*Excision of Entire Scapula.*

Dr. MIKULICZ reports the case of a child whose scapula had been excised by Professor Billroth for disease, in last March. Two incisions were employed, one parallel and a little above the spine of the bone, the other at right angles to this, so as to open the shoulder-joint. The periosteum was found to be nearly entirely detached, the raspatory being only required at the angles and the edges. The coracoid and acromion processes were snipped off. Listerism was used, and primary union took place, it being found only necessary to dress the wound twice, viz., on the sixth and eighth days after the operation. The patient returned to the clinic in October, and it was then seen that the scapula had been reproduced. The new bone was smaller in every way than that on the sound side. The movements of the arm were free, but elevation of the limb could not be accomplished so freely as in the normal arm. The bone that had been excised was exhibited.—*London Med. Record*, Feb. 15, 1879.

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*Removal of the Radius by Absorption.*

Dr. NEDOPIL relates in the *Wiener Medizinische Wochenschrift* for December 7, 1878, the following rare case, which occurred in Dr. Billroth's out-patient

practice at the University Clinic. Josepha Z., a cook, aged 34, applied, in June, 1878, for relief on account of a constantly increasing contraction of the left forearm. In 1868, she was delivered of a child, which died when six years old with symptoms of scrofula; according to her account, the father had syphilis. In 1873 (having been previously in good health), she had serpiginous ulcers of the right thigh; and in 1874 she had disease of the left knee, from which she suffered for three years. The knee swelled spontaneously: the swelling disappeared when she was able to rest, but returned as a result of exertion. She was first treated in hospital early in 1876, for white swelling. As there was no improvement, she left the hospital in August; and in the following October (1876) an abscess formed over the patella, and two small pieces of bone were discharged. Soon afterwards, the knee healed. During her stay in hospital, the radial half of the left forearm became painful and swollen, and the use of the hand became impossible. Local applications of tincture of iodine and warm moist bandages were ordered; and the patient soon ceased to attend. The pain and inability to use the hand lasted about nine months; and when the swelling and pain disappeared (about September, 1877), she observed a constantly increasing deformity of the left wrist, on account of which she again presented herself at the hospital. The left patella was smaller than the right, and the loss of substance which it had undergone had divided it—as if it had been fractured—into two fragments. The knee-joint itself was healthy. The left forearm was distinctly smaller in circumference than the right (14 *centimètres* against 17½). There was subluxation of the hand towards the radial side. On palpation, no trace of the diaphysis of the radius could be found. The epiphyses were both present; their ends were directed towards the ulna, and could be rather extensively moved by passive motion. Supination was much impeded; the other movements of the hand were perfectly free and strong. On forced passive flexion, the muscles on the radial side of the arm contracted strongly; but it could not be ascertained with certainty whether the epiphyses of the radius were connected by a firm band. In a note to this case, Dr. Billroth refers to a case shown him by Dr. Barbieri of absorption of the lower jaw, without suppuration, but with much pain, in a man about fifty years old. He mentions also a preparation in the pathological museum at Zürich, of a tibia of which only the epiphyses and a diaphysis about as thick as a crowquill remains: it is catalogued as “concentric atrophy of the tibia.”—*British Med. Journal*, Feb. 15, 1879.

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*Treatment of Neuralgia of the Superior Maxillary Nerve by Resection of the Infraorbital Nerve in the Orbital Cavity.*

Dr. LASALLE (*Thèse de Paris*, 1877; and *Bulletin Général de Thérapeutique*, November 30) is of opinion that resection of the nerve is the only efficient way of healing, or at least soothing, inveterate chronic neuralgia. It ought to be performed either beyond the painful branches, or between them and the root of the nerve, but as far as possible from its termination. In cases of peripheric neuralgia the pain ceases almost instantaneously after the operation, but if its cause be in the nervous centres, the pain is only temporarily calmed. Having duly considered all these points, the author gives it as his opinion that the most favourable spot for the resection of the nerve is the orbital cavity, the operation being neither difficult nor the consequences dangerous. This situation is, therefore, preferable to the pterygo-maxillary fossa, where it is very difficult to perform the operation. It is also attended by much danger, so that it ought only to be made when the neuralgic pains have been caused by some traumatic affection of Meckel's ganglion. Dr. Lasalle thinks it also advisable to remove the whole of the superior



maxillary nerve instead of simply dividing or resecting it within the orbital cavity, as these operations only afford a momentary relief.—*London Med. Record*, Feb. 15, 1879.

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*Suture of Nerves.*

Dr. BAKOWIECKI, working in the histological laboratory at Kiew (*Gaz. Médic. de Paris*, October 26, 1878) on the condition of nerves after suture, finds that the suture of nerves considerably hastens their cicatrization, and the re-establishment of their functions; that it is necessary to unite the cut nerves within twenty-four hours of their section, and to perform the operation in such a way as to prevent the ligature from passing through any structure except the neurilemma; and that sutures of catgut must be alone employed, as they do not cause suppuration, whilst they are wholly absorbed in the wound. Suture prevents the appearance of tetanus. Eulenberg and Landois obtained negative results because they passed the ligature through the whole thickness of the nerve. The experiments of Dr. Bakowiecki were made upon various animals; they were one hundred in number; the nerves sewn were the sciatic, vagus, and hypoglossal. The sutures employed were of silk, silver, and catgut prepared by Lister's method. The microscopical appearances seen were in the negative cases, in which no regeneration of the nerves took place, destruction of the axis cylinders. In the positive cases, in which there was regeneration of the nerve-fibres, a bud made its appearance at the end of the axis cylinder of the nerve. After a lapse of thirty days, filaments (axis cylinders) were seen, which appeared to consist of fusiform cells communicating with each other by their prolongations. Around the filaments a pale contour line could be distinguished; this line the author believes to be the medullary sheath. The filaments themselves join directly the original nerve-fibres of the central end of the cut nerve. The author supposes that new nerves are thus formed, and he bases his supposition upon three facts. In the first place, the filaments just described pass directly into the nervous fibres. Secondly, the portion of regenerated nerve is composed of these fibres. The nerve, when so formed, is found to have recovered its functional properties. Lastly, the filaments are strongly stained by carmine, and they act in the presence of certain chemical reagents in exactly the same way as do the true axis cylinders. The pale contour-line is supposed to be the medullary substance of the nerve, and not the neurilemma or sheath of Schwann, because no nuclei have been found in it.—*London Medical Record*, Feb. 15, 1879.

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*Nerve-Stretching in Tetanus.*

Dr. J. J. L. RATTON, Professor of Surgery at the Medical College, Madras, has published a small pamphlet with the praiseworthy object of encouraging the study of tetanus, and especially its treatment. Hospital statistics which he gives show that the disease at Madras is most prevalent and fatal in April, and least so in September and December. It affects natives more than it does Europeans, apparently because the native is more exposed to the changes of temperature between night and day. He has had more cases in patients kept in sheds out in the open air than in the wards of the general hospital; and cases frequently occurred after a rain storm. Regarding treatment, he is most in favour of chloral hydrate, but it must be given very boldly and continuously in heroic doses, kept up for at least a week or ten days. Drachm doses should be given every two or three hours till the patient is so far narcotized that he lies in a state of sleep, from which he can be roused to take food in a mechanical way at intervals. When the narcotism has been established the medicine may be given less frequently. Dr.

Ratton declares that it is worse than useless to give the chloral timidly or intermittently. He devotes some attention to nerve-stretching, of which his impression is favourable, as a means "of modifying the conductivity of the whole nerve, from its roots to its termination, and of establishing a new and healthier action in it." He gives four cases in which he performed this operation, but of the four three were fatal, although the *clonic* spasms of the limbs appeared to be controlled. The patient who recovered was kept under the influence of chloral for a fortnight after the operation. The other patients died from exhaustion, and would probably have died under any treatment. Dr. Ratton does not seem to think the carbolic spray essential to the operation of nerve-stretching, and, curiously enough, seems to consider that suppuration in the course of the nerve that is stretched is "an important factor in the remedial action of nerve-stretching."—*Med. Times and Gazette*, Jan. 18, 1879.

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## OPHTHALMOLOGY AND OTOTOLOGY.

### *Ophthalmoplegia Externa or Symmetrical Paralysis of the Ocular Muscles.*

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Feb. 15, 1879) Mr. JONATHAN HUTCHINSON read a paper on this subject. He commenced by stating that the term ophthalmoplegia had been used by Graefe ten years ago in reference to the class of cases dealt with in this paper; and that more recently Eulenberg, writing of the same cases, had applied the appropriate adjective, progressive. The affection had not, however, he believed, received any notice from English writers. Most of its best marked examples occurred to adults who had suffered from syphilis many years before, but it had been recognized in connection with inherited syphilis, and in some cases without any assignable cause. Its essential feature is bilateral paralysis of the external muscles of the eyeballs; and it sometimes proceeded to such an extent that the eyes were almost motionless in their orbits, and the patient compelled to move his head from side to side when he wished to change the direction of vision. A remarkable fact, however, is that the paralysis rarely proceeds to absolute paralysis, and rarely affects all the muscles in the same degree. Sometimes one or two wholly escape. The lids always droop over the eyes, giving to the patient the appearance of being half asleep; but it is seldom that there is complete ptosis. Ophthalmoplegia interna and paralysis of the iris and ciliary muscle is often present also, but it may be wholly absent. In some cases the optic centres are affected, and blindness with white atrophy results. The facility with which the progress of the disease is influenced by iodide of potassium probably in large measure accounts for the frequent incompleteness of the paralysis, and for the circumstance that it does not always manifest progressive tendencies. In advanced cases the spinal cord is affected, and symptoms of locomotor ataxy are developed, or other forms of paralysis. The author then proceeded to narrate in abstract the particulars of fifteen examples of the malady, thirteen of which had been under his own observation, and two under that of Mr. Warren Tay. In the study of several of these cases he had to acknowledge the able assistance of Dr. Hughlings-Jackson, and in the only one in which an autopsy had been obtained Dr. Jackson was present at it, and the microscopic examination of the brain had been made with great care by Dr. Gowers. The following summary of the clinical evidence was appended: "The facts are too few to admit of statistical analysis, but a brief summary may perhaps be useful. Of the fifteen cases four only occurred in females, and two of these were children. One of the males

was a boy the subject of inherited taint, and the remaining ten were all adults. In eight of the fifteen it seemed certain that syphilis was the cause, in six acquired and in two inherited. Of the remaining seven, it may be said that a reasonable suspicion of syphilis might be entertained in several. Had it not been for an almost accidental revelation of the truth in the case of the man S., after prolonged fruitless investigation, I should certainly have asked the Society to believe that his was an example of the disease without any probability of syphilis. With such a fact in mind, one feels that it is almost impossible to make the negative even fairly probable. In Case 9 no direct question was asked, the patient being a single woman; in the two young children, although nothing could be proved, there were some suspicious facts, and one recovered under the iodide. The case in which evidence is most conspicuously absent is No. 13; but in this the patient is a young man, who may have denied the true history, or who may have either inherited a taint or had acquired disease in some irregular way of which he knew nothing. On the whole, the evidence which connects this affection with syphilis is exceedingly strong, and that which favours the belief that it can occur independently of it must be held to be open to some doubt. In five of the patients, all but one known to be subjects of syphilis, the optic nerves were affected, and blindness with white atrophy resulted. In two cases the fifth nerves were symmetrically affected, and in two there was slight affection of the facials. The almost constant escape of the facials must be held to be a remarkable fact. In one case the palate was affected, and in one—the same patient—smell was lost. None of the patients were deaf, and none had lost taste, and in only one was there any material anaesthesia of the skin of the face. In six cases the lower extremities were more or less weak and liable to pain, the condition approaching more or less closely to locomotor ataxy. I much regret that, owing to imperfect knowledge on my part at the time of their occurrence, the details of facts in reference to this disease are often incomplete. There can, however, be no doubt that ophthalmoplegia externa is sometimes a part of the general malady known as progressive locomotor ataxy, especially when that disease is due to syphilis. One of the patients became insane, and another was liable to attacks of violent mental excitement. Four of the fifteen are known to be dead, but of these a post-mortem was obtainable in only one. In several cases, owing either to the blindness or the youth of the patient, it was impossible to estimate the state of the accommodation, but in a certain number it was proved to be perfect, in a few it was absent, and in a few it varied. The pupil never contracted, was almost always sluggish and of medium dilatation. In one well-marked case it acted fairly. In no single case was it very widely dilated. From these facts we may infer that the lenticular ganglion is often free from disease, and that the vaso-motor filaments, although often enfeebled, are not usually paralyzed. It is difficult to make any confident statement as to the progressive tendencies of the malady of which ophthalmoplegia is a symptom. It is very definitely influenced for good by treatment, and in nearly every case specific measures were adopted. We may conjecture, however, from what happened in several, that in most instances it is an aggressive malady, and would end fatally if treatment were not resorted to. The effects of remedies in several of the cases were very remarkable, the patient being rescued from a very dangerous condition. At the time that most of the cases were under treatment, my opinions as regards the nature of the malady were far less clear than at present, and hence a hesitancy in treatment which was probably often prejudicial. The patients were benefited up to a certain point, but relapses occurred, and the remedy was not pushed sufficiently. It would seem that the iodide of potassium is by far the best means of treatment, and that it ought to be given over very long periods and in increasing doses without

any limit as to precise quantity, excepting its effect on the symptoms. Although relapses are common, yet in several of the cases related a complete arrest appears to have occurred, no treatment having been resorted to for several years. In none, however, was the recovery complete."

Dr. BUZZARD said that there was at present under his care in hospital a young woman, twenty-five years of age, who contracted syphilis eight years ago, and who now was a marked instance of the affection described in the paper. She presents a symmetrical paralysis of all the orbital muscles on each side, with the exception of the left external rectus. The syphilitic history was interesting, and equally so was the fact that she was also the subject of locomotor ataxy in a pronounced degree. She had the ataxic gait, anæsthesia of the soles of the feet, sense of constriction in the abdomen, loss of control over sphincters, absence of patellar tendon reflex, and further suffered from severe "gastric crises"—i. e., attacks of gastralgia, with nausea, vomiting, and sometimes diarrhœa. There was also wasting of the scapular muscles, particularly the rhomboids, of one trapezius, and one pectoralis major muscle. It was remarkable that all these changes should have been set up within two years and a half, and he thought the case bore out Mr. Hutchinson's suggestion that in "ophthalmoplegia externa" there is disease of the motor nerve nuclei of the eye parallel to that occurring in the anterior cornua of the spinal cord in progressive muscular atrophy; for this patient not only had the ocular paralysis conjoined with wasting of other muscles (exceptional in locomotor ataxy except as a late event) but had also those marked gastro-intestinal phenomena which might be attributed to lesions about the vagi nuclei.

## MIDWIFERY AND GYNÆCOLOGY.

### *A Duplex Uterus with Double Conception.*

Dr. SOTSCHAWA, of Moscow, relates (*St. Petersburg Med. Woch.*, Jan. 25) the case of a woman, aged twenty-six, who applied to him on account of hemorrhage occurring during her third pregnancy. On examination it was found that there were two distinct vaginae, each leading to a uterus. The finger passed up readily through the first of these so as to be able to feel the presenting ovum, the uterus seeming to correspond to about the second month of pregnancy. The vagina on the other (the right) side was more narrow, but allowed the cervix of what seemed a third-month uterus to be felt. Hemorrhage was taking place from both uteri, and, in consequence of this being considerable, an embryo of a month old was removed by the finger from the left uterus; and three days later a three-months fœtus was extracted from the right uterus. The author observes that the case is not only remarkable for its rarity (only thirty similar cases being on record), but also as testifying to the probability of superfœtation.—*Med. Times and Gazette*, Feb. 22, 1879.

### *Treatment of Tubal Pregnancy.*

Dr. VEIT (*Deutsche Zeitschrift für prakt. Med.*, No. 49, 1878) says that about one-fifth of the cases of hæmatocele are due to rupture during tubal pregnancy; and that the latter is more frequent and capable of a more favourable prognosis than is generally supposed. In the rare cases in which an early diagnosis of tubal pregnancy can be made, expectant treatment is indicated. When rupture occurs, an attempt must first be made to arrest the hemorrhage by external means; and,

as a last resource, laparotomy must be performed, although it does not afford a very good chance. The method of arresting the hemorrhage will vary in different cases; sometimes it will consist in the application of sutures, sometimes in removal of the sac, etc. Dr. Veit performed laparotomy on a moribund patient to arrest the hemorrhage produced by rupture in tubal pregnancy. The Fallopian tube was tied, the sac sewn to the lower angle of the wound, and plugged with salicylized cotton-wool. After two days, plastic peritonitis set in, of which the patient died sixty-four hours after the operation.—*British Med. Journal*, Feb. 15, 1879.

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*Labour with Cleft Pelvis.*

Dr. A. GUSSEROW (*Berliner Klin. Wochenschrift*, Jan. 14, 1879) had the following case under his care 17th November, 1878, in the Charity Hospital. A girl, aged 19, came to the hospital in labour. She was the subject of ectopia vesicæ. The following is a translation of the account of the condition, presented. "At the lower third of the anterior abdominal wall was the posterior wall of the bladder. It was red and covered with a moist mucous membrane 7 centimètres broad and 5 centimètres long. At the lower margin of this membrane were seen the two openings of the ureters from which urine dribbled continuously, and frequently spurted out a distance of a foot under the contractions of the abdominal walls, and during labour pains. The skin over the abdomen in the neighbourhood of this projecting posterior wall of the bladder was cicatricial in appearance, and of a brownish hue. No umbilicus was to be seen. Underneath, the wall of the bladder was continued as a fold of skin about 2 centimètres broad, of a bright red colour, but not showing the characters of mucous membrane, although part of it was regarded as being the posterior wall of the urethra. Under this was the opening of the vagina, 3 centimètres long and 5 centimètres broad, which was irregular in shape, owing to the absence of the sphincter vaginæ. This opening was surrounded by two very rudimentary, irregularly shaped projections of skin, which represented the labia majora and minora. At the upper margin of the opening were two well developed folds of skin, which were the divided corpora cavernosa of the clitoris. Under the skin could be felt and seen the two ends of the divided rami of the pubes, about 8 centimètres apart. The interspace was partly filled in by the posterior urethral wall, and partly by skin spreading from the integument covering the pubic rami. The outer margins of this skin were sparsely clothed with pubic hair. From the lower margin of the vaginal opening was stretched a tense perineum 4 centimètres in length, which, together with the anal aperture, appeared to be directed forwards and upwards. This unusual condition was further complicated by the protrusion, through the small and irregularly shaped vaginal opening, of the child's foot as far as the ankle, and a pulseless loop of knotted umbilical cord, which had also prolapsed." The waters had burst two hours before her admission into the hospital. Although the uterine contractions were powerful, the labour did not progress, and Dr. Gusserow made two incisions from the sides of the vulvar opening towards the tuberosities of the ischia. This he did to enlarge the opening and to avoid the rupture, which appeared imminent, of the posterior bladder wall. The delivery of the child and placenta was then readily effected. Lying-in normal. Dr. Gusserow states that up to the present time only five cases of labour have been observed in similarly deformed pelvis. The first by Bonnet, 1722; the second by Ayres, 1859; the third by Litzmann; and the fourth and fifth by Günzburg, who published them in the *Petersburger Medizinische Zeitschrift*, 1872-73.—*London Med. Record*, Feb. 15, 1879.

*Cæsarean Operation with Removal of the Uterus and Ovaries.*

Prof. GUSTAV BRAUN related (*Allg. Wein, Zeit.*, Dec. 17, 1878) to the Vienna Medical Society an instance of this operation which had just occurred in his practice. A rickety primipara of extremely small stature, with a very large head, was brought into the Midwifery Klinik, December 12, the liquor amnii already discharged, and the labour pains having commenced. On examination, the measurements of the pelvis were found to be so extremely small that craniotomy could not be safely performed, and the Cæsarean section was at once resorted to, as the action of the child's heart had begun to fail. The child having been extracted, the uterus and ovaries were removed by means of the écraseur, which had been previously applied. The placenta was not removed, but remains attached to the preparation of the removed uterus, the bleeding which occurred being quite insignificant. Prof. Braun observed that this made the fifteenth case now recorded in medical literature in which this procedure had been employed, and nine of these terminated favourably. It is to be expected that in the future this operation will be more frequently resorted to, as by this method great losses of blood and other inconveniences can be avoided.—*Med. Times and Gazette*, Jan. 18, 1879.

*Relation between the Age of the Mother and the Sex of the Child.*

BIDDER, in the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band 2, gives the results of his observations on this subject. In 4,441 primiparæ, the proportion was 100 female to 111.5 male children. Very young primiparæ gave birth to a large proportion of boys; those of twenty or twenty-one years old, had more girls than boys; while, as the age increased, the proportion of male children again rose. In 7,430 multiparæ, there were 100 female to 112.4 male children. The proportion of males exceeded that of females in those aged from seventeen to twenty-one; the number sank in the twenty-second and twenty-third years, reached its minimum at the ages of twenty-four and twenty-five, and then again increased in proportion to the age of the mothers.—*British Med. Journal*, Jan. 25, 1879.

*Use of Jaborandi, or Pilocarpine in the Treatment of Puerperal Albuminuria and Convulsions.*

In a paper read before the New York State Medical Society (*Med. Record*, March 1, 1879) Dr. FORDYCE BARKER narrated six cases of puerperal albuminuria which he saw in consultation, from the study of which and of cases reported by others he has become convinced that the utility of jaborandi is more than doubtful, and that, after puerperal convulsions, its depressing influence and action, which is continuous and exhausting, prevents sleep and the repose of the nervous system, and thus renders it in these cases an unsafe and dangerous remedy.

Dr. STROGNOWSKI (*Centralblatt für Gynäkol.*, 1878, No. 20, and *Medicisch-Chirurgische Rundschau*) after having tried in vain to calm an eclamptic patient by a hypodermic injection of morphia, resolved to try some other method. He accordingly injected a syringe-full of 2 per cent. solution of pilocarpine. Two minutes later the usual symptoms, profuse perspiration and salivation, had begun; the patient grew calm and fell asleep; and after three hours labour-pains began. A second injection was then made, five hours after the first. The child was extracted with the forceps. The mother was perfectly cured of the disease. The quantity of albumen in the urine, which had at first been very considerable, disappeared within eight days.

*On the Use of Solution of Perchloride of Iron as a Styptic and Caustic in  
Gynaecological Practice.*

Dr. MATTHEWS DUNCAN records (*Edinburgh Med. Journal*, Feb. 1879) a case of death from injection of perchloride of iron into the uterus, and prefaces it with some remarks from which the following extract is made:—

Like most, if not all, gynaecologists, I have for a long series of years been in the habit of using locally strong and weak solutions of perchloride of iron, generally the former, in various ways, with various objects in view; and, except occasionally much pain and a very rare adhesive perimetritis or phlegmasia dolens, I have seen, amid advantageous results, nothing to counterbalance the good, till the case, to be now related, occurred. As a styptic in all extreme forms of uterine bleeding, and in connection with early abortion and uterine diseases and operations, and in vaginal and vulvar diseases and operations, as a caustic in endometritis, I have applied it without stint. It is recommended, in most works on gynaecology, to be used in such ways, and in others, as by injection into cancerous tissues. I have always injected it gently, that is, under slight pressure, and have used little at a time, not more than a drachm. If more was used, I have paid attention to the previous dilatation of the cervix.

Von Haselberg, Barnes, and Kern<sup>1</sup> have related cases of passage of the iron solution through a Fallopian tube, but of this I have seen no example. In Von Haselberg's case the occurrence was explained by the open condition of the tube.<sup>2</sup> Klemm, whose work, *Ueber die Gefahren der Uterin-injection*, is referred to by Schroeder, but which I have not seen, is the only author whom I know that refers to the danger of injected fluids passing into uterine sinuses, and then into veins in the broad ligament. His data seem to have been the results of experiments, and are no doubt of great value.

The following case demonstrates the passage of the iron solution through the uterine sinuses into the veins of the broad ligament and the mode in which death was produced. In consequence of it I intend now to make use of tincture of iodine, hoping for results like those of the iron solution without its attendant dangers. The following is an abstract of the history of the case:—

The woman was suffering from ulceration of the cavity of the body of the uterus, which was supposed to be malignant. She had much bloody and watery discharges from the vagina, and was very anxious that some attempt should be made to stop it and cure her. The uterus was enlarged and retroflected, the cervix large and patulous. Through the latter, after dilatation, the finger could be passed into the cavity of the body of the uterus. Nitric acid was first used, and subsequently the iron solution. It was the second injection of the solution of perchloride of iron that was followed by disaster. Till this, benefit of a temporary kind was gained from the injection.

After the second injection, which was made with the greatest ease and gentleness, she had pain in the hypogastrium of great severity, with weakness and symptoms of extreme prostration, yet she was able to walk from the operating theatre to her bed in the large ward. Now came on the most alarming appearance of impending death, which I said to the bystanders could be accounted for only by embolism, the abdominal pain and every indication of peritonitis being absent. But I could not account for the embolism. I had not then any knowledge of Klemm's experiments. Under treatment she partially rallied. Her death was sudden, and quite unexpected at the time by the very intelligent sister, who

<sup>1</sup> See Schroeder, *Handbuch der Krankheiten der weiblichen Geschlechtsorgane*. 2te Aufl. s. 129.

<sup>2</sup> On this subject see *Edinburgh Medical Journal*, June, 1856, p. 1057.

happened at that minute to be standing by, engaged in conversation with her. Death occurred nearly two days after the injection.

### *A New Method of Removing Submucous and Interstitial Fibroids of the Uterus.*

Dr. T. GAILLARD THOMAS advocates (*Med. Record*, Feb. 8, 1879) the removal of these forms of uterine tumours by seizing the most dependent and accessible part of the tumour with a strong vulsellum forceps, passing along its sides his *serrated scoop, or spoon-saw*, and by a gentle pendulum motion from side to side, sawing through the attachments of the tumour and forcing it entirely from its connection with the uterus.

The advantages claimed for this instrument are the following :—

1. The attachments were separated by a saw which greatly limited hemorrhage.

2. The shape of the spoon, convex without and concave within, caused it to follow of itself the contour of the tumour, and at the same time protect the uterine tissue.

3. The highest attachment could be as readily reached as the lowest.

4. The saw action secured separation with rapidity and with certainty.

5. The spoon-saw secured separation of the growth at its highest point of attachment, and left no peduncle to decompose.

As regards the size of tumours which can be thus removed, Dr. Thomas says that in any case in which the vulsellum forceps could be fixed in a fibrous tumour of a size sufficiently small to admit of its delivery by the vagina, detachment of it from the uterus could always be accomplished by this method. The accident of cutting into the peritoneum was less likely to occur than when enucleation was employed.

Any tumour which could be completely accommodated in the pelvis could be delivered without diminution in bulk ; but sometimes a projecting part of the tumour might fill the pelvis completely, and still a larger portion might remain above the superior strait, which could not be drawn through without mutilation. Under such circumstances, he recommended the following methods of delivery :—

1. Seize the tumour with strong forceps, draw it down, sever the distended perineum to the sphincter ani, partially or completely invert the uterus, detach the tumour by the spoon-saw, replace the uterus at once, and close the perineum by sutures.

2. Successive sections of the tumour might be cut away by means of the galvano-cautery wire.

3. A large trocar and canula, or the actual cautery, or the trephine obstetric perforator, might be used to channel up the middle of the tumour, and then, with a strong pair of scissors or osteotome, pieces could be cut out, and the tumour so diminished in size that it was susceptible of delivery.

That either of these ways were better than enucleation or the production of sloughing, he had not the slightest doubt, from his own observation and experience.

### *A Series of Fifty Ovariectomies.*

The *Berliner Klin. Wochenschrift* (No. 1, 1879) contains a table of fifty most recent ovariectomies performed by Professor SCHROEDER according to the strict antiseptic method. They extend over the period from February to December, 1878. Seven patients, or 14 per cent. died ; and forty-three, or 86 per cent., recovered. All the deaths occurred in very difficult and complicated cases. In



one the immediate cause of death (in the second week) was adhesion of the pedicle to the wall of the pelvis, so as to strangulate the rectum; another patient died from shock; a third had myxomatous degeneration of the whole peritoneum. The remaining four died, one from fatty degeneration of the heart, the three others from septicæmia. Professor Schroeder remarks, with regard to the latter, that it appears impossible, either with the strictest antiseptic precautions, to be absolutely certain of excluding septic germs from the abdominal cavity. He also thinks that while a few such germs might be nearly innocuous to a healthy organism, they acquire greater virulence in a depressed and diseased subject, with numerous wounds to afford them a congenial proliferating surface. He also points out that, after loss of blood, the "suction power" of the circulatory apparatus will be more vigorous, and hence the penetration of the germs to distant parts of the system more easy. Two of the cases were complicated with pregnancy, and both ended favourably as far as the mothers were concerned. Professor Schroeder has as yet operated five times in pregnant women, the diagnosis in each case having been previously made. All five recovered. Three were normally delivered at term; one aborted after the operation; and the fifth gave premature birth to a living child, which, however, afterwards died of general weakness. The operation is best performed in the first half of the period of pregnancy. Later on the broad ligaments receive such an abundant blood-supply, and the pedicle of the tumour becomes so much shortened, that the operative difficulties and dangers are decidedly increased. With reference to a case in which the tumour removed was very small—not larger than a duck's egg—Professor Schroeder remarks that such small tumours are more difficult to operate on than those of medium size. Both here and in Battey's operation for the removal of normal ovaries, he makes the incision in the linea alba long enough to introduce the whole hand into the peritoneal cavity, and so bring the ovary or growth outwards, ligature, and remove it. Tumours of unusual size, on the other hand, are troublesome because their removal leaves "too little to fill the abdominal cavity, and too much wall to cover it." If the intestines and mesentery are not of sufficient size, it is difficult to expel the air, which always enters the abdomen when its wall is incised, after the operation. This air may or may not be free from septic "germs." If free, its presence is of no importance, as it is sure to be absorbed; but of course it is impossible, as above remarked, to insure this. Professor Schroeder, therefore, is accustomed, "if the intestine does not sink of itself into the pelvic cavity, to pack the latter with the sigmoid flexure of the large intestine, and then with coils of small intestine, and to spread the mesentery over all. It is thus easy to expel the air before the last sutures are secured." If, however, the mesentery is, as happens in cases of some very large tumours, too short to allow the small intestine to descend, there is nothing for it but to press the flaccid abdominal walls deep into the pelvis, and thus expel the air. This, of course, renders the accurate closure of the wound by sutures much more difficult. In two cases Professor Schroeder has even removed a piece of the abdominal parietes, but only one of them benefited materially by the excision. This was a case where the portion removed included the sac of an umbilical hernia the size of a man's fist.—*Med. Times and Gazette*, Jan. 18, 1879.

#### *Triple Ovariectomy.*

Cases in which the presence of a supernumerary ovary has been discovered are very rare, and we believe that the following case of triple ovariectomy, performed by Dr. WINKLER, of Dresden, is unique: Emily S——, thirty-nine years of age, confined seven years previously, was seen in July, 1877. She had observed

a tumour for about six years, and had had several attacks of severe peritonitis. The tumour was evidently bilocular, one large cyst filling the cavity of the abdomen, and the other that of the pelvis. She was tapped in July, and Dr. Winkler performed ovariectomy in August. The large cyst was extensively and firmly adherent to the abdominal wall in front and behind, also to the liver and omentum. The smaller cyst occupying the pelvis was not adherent. The pedicle was attached on the left side. It was tied and dropped into the pelvis. The right ovary was found to contain a mass of small cysts; its pedicle was also tied and dropped. While cleaning the cavity of the belly, a fact diagnosed previously was verified—namely, that there was present considerable mobility of the right kidney. But in the left half of the pelvis was also found a tumour containing two small cysts. The pedicle was tied and dropped. The cavity of the abdomen was drained, but the patient died of septicæmia on the fourth day. Ovarian tissue was found in each of the tumours removed, and it was evident that two ovaries were present on the left side, inasmuch as there were two distinct tumours, each possessing a distinct and separate origin.—*Lancet*, Feb. 15, 1879.

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*A Case of the Double Operation of Ovariectomy and Hysterotomy.*

Dr. W. H. BYFORD, of Chicago, reports (*Am. Journal of Obstet.*, Jan. 1879) the case of a young unmarried lady, aged 23, of “unblemished reputation,” who was brought by her physician to see him in consultation about an ovarian tumour which had been first noticed about one year before, and had grown more rapidly in the last six months; the menses had ceased “several months since;” a vaginal examination was shrunk from by the patient, and was not insisted upon as being absolutely necessary. The diagnosis of an ovarian tumour, probably of the left ovary, and mono-cystic ovariectomy was performed, and twelve quarts of an amber-coloured fluid drawn off. “When the sac was nearly emptied, I noticed a tumour behind it, adhering to the sac and preventing it from passing out through the incision. The second tumour was elastic, and so perfectly resembled a secondary cyst, that I had no hesitation in plunging the trocar through its walls with a view still further to lessen the bulk of the entire mass by evacuating its contents. As the trocar met with unusual resistance, and nothing but blood passed through it, I became convinced that there was something unusual about it. The incision was somewhat enlarged, and, as much of the emptied sac drawn out as would pass, when it was discovered that slight adhesions, and not continuity of tissue, connected the two. After the cyst was entirely withdrawn, I was astonished to find that the second tumour was the impregnated uterus, and still worse, that it was wounded and bleeding.”

Dr. Byford now decided that the only way out of the difficulty was to evacuate the uterus. This was done by making an incision about four inches long from near the fundus downwards, so as to include the accidental aperture. The incision exposed the placenta at about the middle of its attachment. This organ was easily and rapidly separated, by passing the index finger between it and the uterine walls, and completely removed. After this was done, the right side of the fœtus, the arm, hip, and feet were perfectly exposed. The breech was seized and drawn towards the opening, when the fœtus was expelled by uterine contraction. The membranes and liquor amnii were next removed, when the uterus was perfectly devoid of all its former contents.

Gestation had advanced to about the middle of the seventh month. The fœtus evinced no signs of life after its removal, and had doubtless died from the effect of hemorrhage from the wounded placenta.

The incision in the uterus was closed by interrupted sutures of fine silk, including the visceral peritoneum, the whole of the muscular wall, and the mucous

membrane. The sutures were cut short, and no provision made for their removal. By the time the sutures were all inserted and tied, the uterus had contracted very firmly.

In order to secure a free exit of the lochia from the cavity of the uterus, and thus prevent the danger of its passing through the wound, the os uteri was freely dilated with the finger, and a long flexible catheter left in some hours. The pedicle of the ovarian cyst was tied with a double ligature of plaited silk, and returned into the abdominal cavity. The ligatures were brought out at the lower angle of the wound, and left long enough to hang down between the thighs. The wound in the abdomen was closed by interrupted sutures, and dressed with a thick layer of carbolized cotton batting. The only interest connected with the future prognosis of the case is, that there was not a disagreeable symptom, except a few trivial after-pains.

Dr. Byford gives abstracts of five cases, which are all he was able to find on record, of the double operation of ovariectomy and hysterotomy, the results of which are confirmatory of the correctness of his practice in this case.

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## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

### *Poisoning of a New-born Child with Nux Vomica.*

Cases of infanticide by poisoning are very rare. The following is reported in the *Vierteljahrsschrift für gerichtl. Medicin.*, vol. xxv. Children destroyed within a week of birth generally die from some form of violence which insures rapid death. A girl was secretly delivered of a child on the night of the 16-17th October. She concealed the child, and suckled it for one or two days. On the evening of the 18th October she gave it some camomile tea, into which she had put a teaspoonful of powdered nux vomica. The child had convulsions and died in two hours. The body, which had been thrown into a ditch, was found and submitted to medical examination on the 21st October. It was a mature child and well formed. Although three days had elapsed since death, cadaveric rigidity was very strongly developed in it. Around the navel there was a red circle with a commencement of suppuration. The stomach contained a teaspoonful of a mucilaginous liquid; in the small intestines chymous matter was found, and the large intestines were distended with fecal matter. The viscera of the chest presented the characters of asphyxia. There was no question here of the proofs of live birth. The experts who made the examination came to the conclusion that the child was mature, viable (*i. e.*, had a capacity to live), that it had completely and fully breathed and had died of asphyxia, not before the second day after birth. At this time the mother was unknown, but suspicion fell upon the girl; it was proved that she had been recently delivered, and a box containing nux vomica in powder was found in her possession. A chemical examination of the stomach, intestines, and liver was made, but although that process was employed, not the least trace of strychnia could be detected in the body. There was no doubt, however, that the child had died from strychnia poisoning. The girl confessed the crime

## RECLAMATION.

*Note on Cholecystotomy.*—By W. W. KEEN, M.D., Surgeon to St. Mary's Hospital, Philadelphia.

In a paper in the January number of this Journal, in which I related a case of Cholecystotomy, I referred to Dr. Sims's case as the first that had been done, although the operation had been proposed and discussed much earlier as I stated. I was not aware of one somewhat similar case to which I should have referred, nor of another which, although already published, had not then reached this country. The first case is reported by Prof. Roberts Bartholow and others in the *Cincinnati Clinic* for April 7–21, 1877. In this case Prof. B. aspirated a hydatid cyst of the liver September 10, 1876, and (probably) in December of the same year aspirated the gall bladder removing “six ounces of dark green and very thin bile.” So far as I have searched this is the first case in which aspiration of the gall bladder has been done. “No local irritation was produced and careful search after death failed to detect the point of puncture.” Moreover, Prof. B. distinctly proposed “the propriety and utility of exploring the cystic and common duct, and had made a small probe twelve inches in length with which to perform this feat. He found that when a small canula is fixed in the gall bladder it is easy to pass a probe of suitable size into the cystic duct. It is probable that such an expedient may be practised in the future with success.” To Prof. B. belongs therefore the credit of first formulating such an *aspiration* and *exploration* and of first performing the aspiration itself.

The other case is that of Dr. Geo. Brown (*Brit. Med. Journ.*, Dec. 21, 1878). He aspirated a supposed abscess and drew off  $f\frac{3}{4}$  vj of non fetid pus. He passed a probe into the abscess cavity and felt some supposed gall stones. January 22, 1878, he made an incision  $2\frac{1}{2}$  inches long, opening the peritoneum, could not reach the gall bladder, tore through some adhesions and closed the wound. In the night bile began to be discharged, the tumour disappeared, and she recovered without a fistula. The antiseptic method was not used.

The earlier literature on the subject shows, it is true, that the operation has been both discussed and practised before Sims's operation, but it must be conceded that to him is due the credit of placing it on a new basis as a deliberate operation in the surgery of the abdomen. The earliest reference I have found to the operation is in Petit (*Maladies Chirurg.*, i. 282). Though published in 1790 he states that he read his paper in 1733, and it was already published in the *Mém. de l'Acad. Roy. de Chir.* for 1743, i. 255. He quotes four cases operated on, generally for a supposed abscess, in one of which he himself began the operation but abandoned it. Two of them died, his own case recovered; the fourth recovered with a fistula through which a calculus was removed at a later period.

He advocates (pp. 312–13) *puncture by a trocar* (the aspirator of course was then unknown), *exploration* by a sound, and removal of a stone if any be found. He then says it is not a new operation, and refers (but does not give his authority) to the two operations done on Mme. Tibergeau. The first was the opening of a supposed abscess which was followed by a fistula, and through this some months later (as in the previous case) the stone was removed. He gives also several cases of removal of calculi through exist-

ing sinuses as has frequently been done. Mr. Bryant has just reported a similar case (*Med. Times and Gaz.*, 1878, ii. 682).

Le Dran (*Traité des Oper. de Chir.*, 1742, p. 253) refers also to the proposals to puncture by a trocar, but opposes it unless adhesions have formed.

Morgagni (*De Sedib. et Causis Morb.* 1761, Bk. iii. Letter xxxvi. Art. 52) says, "It does not escape me, however, that before the swelling occupies all the muscles which lie before the cyst, causes a considerable suppuration on all sides, and the pus forms winding sinuses for itself. . . . the case must of course turn out more successfully with those who open by incision the cyst which has now closely coalesced with the peritoneum" but prefers to wait "till time shall confirm its advantages and remove all doubts, dangers, and difficulties by many repeated experiments." He refers also to the cases of three women of Bologna (Taccon, *De rariss. quibusd. hepat. affect. observ.*), Francfort (*Act. n. c. tem.* 6 obs. 69), and Göttingen (*Haller, Opusc. Pathol.* Obs. 33, Hist. 8), all of whom had tumours in the epigastrium which were "opened either by art or spontaneously and discharged cystic calculi at the aperture." The first was cured, the second recovered with a fistula, and the third with an ulcer. I cannot verify any of the references.

Good in his *Study of Medicine* (6th Amer. ed. 1835, p. 215), says, that attempts were formerly made to remove such calculi by incision. He quotes a case by Bloch (*Med. Bemerk* No. 5, a reference I cannot verify) in which 62 calculi "were taken away with success, but in general the operation has not answered."

Mr. Harvey (*Lancet*, 1849, i. 182), tapped a case of supposed ovarian cyst. The patient died after doing well for two weeks, and the post-mortem revealed a cyst connected with the left lobe of the liver which was destroyed.

In 1859 Dr. Thudichum (*Pathol. and Treat. of Gall Stones, Brit. Med. Journ.*, Nov. 19, p. 935) suggested "performing an operation for the extraction of these foreign bodies either in a direct manner, or by forming a biliary fistula and adopting a lithotriptic proceeding." He proposed to open the abdomen, seize the gall bladder, fasten it to the abdominal wall, and after adhesions have formed to open it, an operation that has much to commend it. He also noticed two facts of importance: first that the supposed bile contained not a trace of the bile acids as was the fact both in Dr. Sims's case and my own; second the probability of the nucleus of some of these calculi being casts of the biliary ducts. In the discussion which followed the reading of his paper before the Medical Society of London Mr. Hilton "thought it not impossible that cases fit for operative relief might present themselves and in cases of distended gall bladder (which might occur with calculi) an operation such as the author had mentioned had actually been performed with success." No references are given, and I have not found any such cases except as given above. The suggestions of Mr. Maunder and Dr. Hughlings Jackson I have referred to in the former paper as also to Dr. Sims's case.

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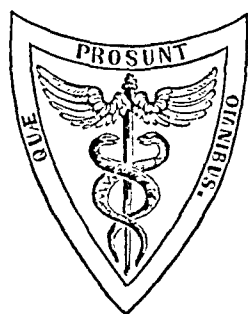
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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of August.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent to the Editor.*

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The usual American exchanges have been received; their individual acknowledgment is omitted for want of space.

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OF

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ARTICLE I.

SARCOMA OF THE LONG BONES; BASED UPON A STUDY OF ONE HUNDRED AND SIXTY-FIVE CASES. By SAMUEL W. GROSS, A.M., M.D., Mütter Lecturer on Surgical Pathology in the College of Physicians of Philadelphia, and Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.

In the last edition of his work on "Surgical Pathology," Professor Billroth states that "the subdivisions, made according to the histological peculiarities of the various sarcomata, are of no great value during life;" but being convinced, from personal observation, that clinical differences exist among the divisions of sarcoma as marked as are met with among the varieties of carcinoma, I have ventured to differ from so distinguished an investigator, and have studied these growths, as all morbid processes should be studied, with the view of determining the relations subsisting between their minute structure and their clinical characters. To attain this end I have carefully analyzed one hundred and sixty-five cases, many of which are original, and the number might have been very materially increased had I included examples of mixed sarcomas. I have limited my investigations, however, to those cases alone in which the histological features of each form of sarcoma were typical, and I have used none, except a few of osteoid sarcoma, about the true nature of which there could be no doubt, that were not confirmed by microscopical examination.

The primary neoplasms of the long bones, exclusive of the clavicle, the metatarsal and metacarpal bones, and the phalanges, which I shall not consider, are, in the order of the frequency of their occurrence, sarcomas, osteomas, chondromas, osteoid chondromas, fibromas, and myxomas. Vascular and cystic growths, as I shall have occasion to show hereafter,

are, for the most part, nothing more than metamorphosed sarcomas, while it is extremely doubtful whether primary carcinoma ever occurs in the osseous system. Since sarcomas affect the long bones more frequently than all the other tumours combined, and as they constitute an important group of morbid growths which are not thoroughly understood, and are described under a great number of different and confusing names, I shall devote this and a succeeding paper to a description of their histology, general pathology, symptomatology, diagnosis, prognosis, and treatment, covering, as far as possible, the entire field, although in doing so I will touch upon some points which may be considered elementary, but which I trust may prove to be instructive to those not entirely familiar with the subject.

The term sarcoma, which is of very ancient date, and was employed by Abernethy to designate tumours "having a firm and fleshy feel," was revived by Virchow, and is now employed by him and other pathologists and most surgeons to indicate a new formation of the connective tissue series, which is composed almost entirely of unripe, transitional, or embryonic cells, which serve to distinguish it, on the one hand, from the perfected tumours of that system, and, on the other, from the carcinomas. From the excessive preponderance, development, and mode of arrangement of its cellular constituents, which endow it with its peculiar characters, and from their indisposition to pass into higher tissues, they constitute a structure which is unlike any natural structure, and may, therefore, be regarded as an atypical production. The cells are contained in an intercellular substance, which is hyaline, granular, fibrillated, or alveolar, which, along with the various degenerations to which these tumours are liable, give rise to certain subdivisions. The principal varieties of sarcoma of the bones, which are determined by the prevailing form and size of their cellular elements, are the round-celled, the spindle-celled, and the giant-celled, the cells themselves merely representing different stages of development. In accordance with the dimensions of the cells, they are, moreover, separated into the small-celled, and large-celled, a distinction which is most useful, not only because the size of the cells influences the consistence of the tumours, but from the fact that it has a special bearing upon the prognosis.

Certain subdivisions of sarcoma are constituted by the nature of their matrix or intercellular substance, by their transformations, and by their vascularity. Thus, when fibrous tissue replaces in great part the ordinary intercellular substance, the growth is called a fibrous sarcoma. When the basis substance has undergone mucoid transformation, it is a myxomatous sarcoma; when it presents the appearance of the reticulum of the lymph glands, it is known as lymphadenoid sarcoma; when it forms an alveolar structure, it is an alveolar sarcoma; when the cells have undergone fatty degeneration and granules of fat and free oil are disseminated in the inter-

cellular substance, it is a lipomatous sarcoma; the presence of certain other constituents, as the mineral salts, bone, or cartilage, produces respectively calcifying, ossifying, and chondroid sarcomas; when they have undergone cystic degeneration, they are known as cystic sarcomas; excessive vascularity gives rise to telangiectatic sarcoma; and effusions of blood, to hemorrhagic sarcoma. All these subdivisions, pure or variously intermixed, are met with in the sarcomas of the long bones, the only one that is missing being pigmented or melanotic sarcoma, of which I have been unable to find a single recorded example.

Sarcoma of the bones is generally denominated osteosarcoma, but the latter term, which is employed by clinicians, should be dropped, since, from a histological standpoint, it signifies a sarcoma, whether it be seated in or on a bone, or in the soft parts, containing osseous tissue of new formations, and is synonymous with osteoid or ossifying sarcoma. As an evidence of the confusion that has arisen from retaining that name, I may mention that Wilks and other English writers call the periosteal osteoid sarcomas osteosarcomas, while many German pathologists employ the term to designate myeloid tumours, which are always central.

According to their point of departure they may be separated into the peripheral, periosteal, or periosseous, and the central, endosteal, intra-osseous, or myelogenic, a division which is not only convenient as designating their seat, but which is also justified by the fact, that, in general, they present marked differences in their histological construction, and are of different prognostic import. Thus, the majority of the peripheral growths, which proceed from the layer of embryonic cells, or osteoblasts, which separates the periosteum from the bone, and is variously known as the osteogenic substance of Ollier, the ossification blastema of Kölliker, the proliferating layer of the periosteum of Virchow, and the cambium layer of the bone of Max Schultze, are osteoid spindle-celled growths, while the central tumours, which develop from the medulla, and from the osteoblastic layer which lines the interior of the medullary canal, are, as a rule, giant-celled sarcomas.

In their macroscopic or gross appearances these two divisions of sarcoma present some points of difference which may be utilized for diagnostic and prognostic purposes, in the absence of microscopical examination. The central tumours, particularly those of the giant-celled variety, are inclosed in a capsule or case, which may be entirely bony, but which is usually partly bony and partly membranous. The periosteal formations, on the other hand, are limited by the outer fibrous layer of that membrane, or, in the event of its participation in the proliferation, by a capsule of connective tissue. In either event, osseous tissue is never found in the investing membrane, so that the presence or absence of bone in the capsule is of great value in the determination of the original seat of the new growth.

Although the sarcomas are very liable to certain transformations which tend to obscure their diagnosis from their naked-eye appearances, yet, in their pure forms, their structure is so dissimilar, that we may judge pretty accurately of their nature by their tints and consistence. Thus a tumour which presents a dark red or maroon colour can be nothing else than a giant-celled sarcoma. Specimens which are characterized by a firm, glistening, grayish-white tissue come under the subdivision of large spindle-celled sarcoma. When there is an admixture of bony spicules and soft tissue, there need be no doubt as to its osteoid nature; should the soft portion be dense and firm, it may be termed an osteoid fibrous sarcoma; if it be soft and medullary, it will probably turn out to be an osteoid round-celled tumour; while, if it be semifluid and gelatinous, it forms a myxomatous osteoid sarcoma. Tumours which have the consistence and appearances of the brain of a newly-born child may be ranked among the medullary or encephaloid sarcomas of the small round-celled type, although the soft, small spindle-celled tumours present precisely similar features. When the tissue looks like a recent coagulum, or contains one or more cysts filled with blood, we will be right in assuming that we are dealing with a highly vascular medullary growth. These conclusions are based upon the combined clinical and microscopical characters of sarcomas, and may be held to be as true for this group of neoplasms as it is true that the gross characters of scirrhus carcinoma, for example, correspond to a known type of structure.

In their configuration, sarcomas of the long bones vary in accordance with their situation. Central tumours, whether they occupy the epiphyses or diaphyses, are generally spherical. Periosteal tumours are long, oval, or fusiform, when they occupy the shafts; while they are pyriform, with their base towards the articulation, when they surround the articular ends of the long bones; or conoidal, when they develop from a limited portion of the joint-end. Their surface is usually smooth and even, although it may be tuberos, bossed, or lowly-lobed, which is particularly liable to be the case when their investing capsules are implicated in the new formation, and when they have softened, and are about to become the seat of ulceration. Their volume varies very greatly. They may be no larger than a walnut, or they may attain huge dimensions, as, for example, three feet in circumference. In the latter event, it may be assumed that the growth is the seat of interstitial hemorrhage or cystic transformation.

So long as they are circumscribed by their investing capsules, sarcomas merely stretch and push aside the surrounding tissues; but when their capsules take part in the cell proliferation, or are perforated, they evince a locally infectious nature, and become diffused, either through the conversion of the cells of the tissues into like elements, or through the continuous multiplication of the tumour elements. In the peripheral sarcomas, the bone generally passes through the growth unchanged. In some in

stances the cortex of the compact substance is the seat of condensing sclerosis; in others, it is eroded, pitted, or, as it were, worm-eaten. In others, infection of the compact tissue ensues without changes in its outer surface, through which nodules are formed in it, and give rise to what may be termed interstitial sarcoma, although I have never known a tumour to originate primarily in this situation. Again, the disease may extend along the Haversian system to infect the medulla. Finally, the tumour may occupy all these localities, so that we may even find a sarcoma which has originated in the periosteum constituted as follows: masses in the medulla, interstitial deposits in the compact tissue, a large tumour around the shaft, and, finally, one growing from the fibrous layer of the periosteum, the last two of which are merely separated and cut up into lobules by the remains of that membrane. In the central sarcomas, the original bone is usually destroyed to such an extent that not a vestige of it remains.

Next to the carcinomata of the soft parts, the sarcomata of the bones are the most malignant of all neoplasms, as is evinced by the local infection of the adjacent tissues, the occasional implication of the associated lymphatic glands, and the occurrence of secondary deposits in the viscera and tissues belonging to the same series. From their tendency to infiltrate the surrounding structures, they show a great disposition to recur locally after extirpation, so that in the performance of an operation for their removal, the rule should be to amputate as far as possible from the seat of the disease. Unlike the carcinomata, the lymphatic glands are rarely the seat of primary contamination. Thus, of one hundred and thirty-three cases in which this point is noted, these organs were enlarged in only twenty-three. In thirteen of these the lymphatic tumour was merely due to irritation, as was shown by the fact, that in some cases it disappeared after the removal of the primary neoplasm, while, in others, minute examination failed to detect carcinomatous elements. In five fatal cases, the condition of the glands was not noted; while, in only five, were they converted into a tissue similar to the parent growth. These facts are of extreme interest, as they denote, in the first place, that enlargement of the lymphatic glands should not be regarded as a bar to operative interference, and, secondly, that systemic infection generally takes place through the blood and not through the lymph channels.

The general dissemination of sarcoma, or the occurrence of secondary growths in the viscera and in other tissues, is one of the most marked attributes of this class of morbid growths. Thus I find that 46.06 per cent. of all cases are characterized by this clinical feature, the metastatic tumours being found most commonly in the lungs, lymphatic glands, and other parts of the osseous system. In this connection it should be remembered that the secondary deposits are histologically identical with the primary growth. Through ignorance of this fact, it is not uncommon to



find writers describing a case, for example, as one of sarcoma of the femur with secondary cancerous deposits in the lungs, whereas, in truth, the latter do not deviate in their structure from the original tumour. A sarcoma always reproduces its like, a carcinoma its like, a chondroma its like, so that the anatomical peculiarities of a metastatic deposit enables us to decide as to the nature of the original tumour in the event of the latter having been removed by some other surgeon. A naked eye point of distinction between the secondary carcinomatous and sarcomatous growths, as of the liver, is the presence of umbilication in the former, and its absence in the latter.

While it is true that the sarcomas of the bones are to be regarded as malignant affections, yet the signs of malignity—that is to say, infection of the neighbouring tissues and local recurrence, extension to the lymphatic glands, and multiplication in distant parts—are not witnessed in the same degree in the different varieties of sarcoma, as is shown by the following table:—

VARIETY.	Adjacent Tissues. <sup>1</sup> Per cent.	Local Recurrence. Per cent.	Extension to Glands. <sup>2</sup> Per cent.	Generalization. Per cent.
Periosteal spindle-celled .	44	60	0	100
“ round-celled .	50	50	7.69	66.66
“ osteoid .	40	41	6.25	65.62
Central round-celled .	66	25	8.33	33.33
“ spindle-celled .	18	20	0	23.07
“ giant-celled .	12	8	0	22.72

From an examination of the cases of destructive sarcomas, they may be classed, in the order of their malignity, as follows: Periosteal spindle-celled, periosteal round-celled, periosteal osteoid, central round-celled, central spindle-celled, and central giant-celled; the periosteal forms being more malignant by 43.5 per cent., as will be pointed out hereafter. Hence the comparative benignity of the central tumours may, to a certain extent, be ascribed to the slight disposition which they evince to extend beyond their bony or osteo-membranous capsules. With regard to the sarcomas composed of spindle cells—and they are synonymous with the recurrent tumours of Paget—it will be observed that they are endowed with the power of general dissemination to an extraordinary degree, so that the term recurrent, as designating the characteristic peculiarity in their history, is in nowise applicable to them.

Sarcomas of the long bones evince a great predilection for their articular extremities, and the majority develop in the spongy substance of the epiphyses. Whether of central or peripheral origin, they are liable, even

<sup>1</sup> Infection of surrounding tissues as shown on dissection of the limb after its removal.

<sup>2</sup> Instances of enlargement of the glands from irritation are excluded. Compare with page 21.

in the hands of the most skilful observers, to be confounded with other affections, such as aneurism, white swelling, strumous abscess, periosteal abscess, osteomyelitis, and gummata. Of these, aneurism of the bones and strumous articular osteitis have given rise to the greatest number of mistakes. They may be discriminated from abscesses by the exploring needle, and from syphilitic formations by the history of the case. Osteomyelitis, in addition to the tumefaction, gives rise to puffiness of the superincumbent soft structures, and is attended with irritative fever, and, now and then, with deep-seated throbbing pain.

From aneurism of the long bones, if there is really such an affection, and its occurrence is denied by Virchow,<sup>1</sup> Landi,<sup>2</sup> and Broca,<sup>3</sup> the distinction is by no means always easy, particularly when, in addition to the pulsation, there is a bruit, as happened in four instances to which I shall call attention hereafter. In the majority of pulsating sarcomas there is no murmur, or, if it be present, it is not very distinct. Then, too, in sarcoma, pulsation is not found from the very commencement, nor is it expansile, and in some cases it is not remarked until the tumour begins to grow rapidly. Aneurisms, as is well known, are extremely rare before the thirtieth year, while two-thirds of the pulsating sarcomas occur before that age. Finally, when a pulsating growth is situated away from the line of a large vessel, as, for example, in the upper epiphysis of the fibula,<sup>4</sup> it is far more likely to be a sarcoma than an aneurism.

White swelling is very liable to occasion mistakes in the diagnosis, and this is particularly true of those cases in which the adjacent joint has undergone destructive changes from nutritive disturbances, or has been invaded by the growing tumour, when the symptoms are so similar that a differential diagnosis, without exploratory incision, is scarcely possible.

White swelling, as of the knee, for example, usually occurs in scrofulous subjects before the fifteenth year. There is pain from the very outset, which gradually increases in severity, and finally becomes so intense as to deprive the patient of sleep and seriously undermine his general health. The skin is tense and glossy; the superficial veins are abnormally large; the temperature is elevated; the joint is stiff, if not immovable, and efforts at motion produce great suffering; the articulation, moreover, is distorted and flexed; and puncture gives vent to pus or turbid synovial fluid containing flakes of lymph. White swellings do not pulsate, nor does manipulation elicit parchment-like crepitation.

In sarcomas, the absence of suppuration, or the slight tendency to the formation of pus, is a sign of great value. Other important distinguishing features of sarcoma are the preservation of the movements of the joint,

<sup>1</sup> *Pathologie des Tumeurs*, vol. iv. p. 68.

<sup>2</sup> *Amer. Journ. Med. Sciences*, January, 1878, p. 278.

<sup>3</sup> *Traité des Tumeurs*, vol. ii. p. 212.

<sup>4</sup> Langenbeck. *Langenbeck's Archiv*, vol. xxi., supplement, p. 333.

although in some cases the mobility is limited, freedom from suffering on motion, and absence of vicious position. In many cases, indeed, the patients are able to walk about without suffering or experiencing particular fatigue. In sarcoma, too, spontaneous fracture is not uncommon. Resistance to ordinary treatment, moreover, distinguishes sarcoma from white swelling. In the latter affection, rest and extension, along with gentle and equable compression of the joint, are of great benefit in relieving the pain and in restoring the impaired general health; but in sarcoma, the tumour continues to grow despite the employment of these measures, and the local suffering is greatly increased by compression. These features, which have been carefully studied by Gillette<sup>1</sup> and Poinso<sup>2</sup>, when considered in connection with the symptoms previously referred to, will generally suffice to differentiate the epiphyseal sarcomas from strumous articular osteitis.

Sarcomas of the long bones are most frequent in those of the lower extremity; the femur, tibia, and fibula being affected in 76 per cent. of all cases. Thus—

Out of 165 cases which I have analyzed,

The femur was the seat of the disease in 67 instances.

The tibia       “       “       “       “       46       “

The humerus   “       “       “       “       25       “

The fibula     “       “       “       “       13       “

The ulna       “       “       “       “       7       “

The radius    “       “       “       “       6       “

The ulna and radius were the seat of the disease in 1 instance.

Separating these in accordance with their histological construction:—

70 were examples of giant-celled sarcoma.

45 “       “       periosteal osteoid sarcoma.

16 “       “       central spindle-celled sarcoma.

13 “       “       periosteal round-celled sarcoma.

12 “       “       central round-celled sarcoma.

9 “       “       periosteal spindle-celled sarcoma.

Hence it follows that the giant-celled tumours are the most common, forming, as they do, 42 per cent. of the entire number. It will also be seen that the central tumours are more frequent by 18 per cent. than those which arise in the periosteum.

Males are more liable to their occurrence by 17 per cent. than females, as is shown in the following table of 149 cases in which the sex is given:—

<sup>1</sup> Bull. et Mém. de La Soc. de Chir. de Paris, vol. ii. 1876, p. 115.

<sup>2</sup> Ibid. vol. iii. 1877, p. 208.

Nature of Tumour.	Males.	Females.
Central giant-celled . . . .	33	30
“ round-celled . . . .	7	5
“ spindle-celled . . . .	11	5
Periosteal round-celled . . . .	10	3
“ spindle-celled . . . .	4	5
“ osteoid . . . .	22	14
	<hr/> 87	<hr/> 62

The age at which they first manifest themselves averages 27 years. In the following table of 147 cases in which the age is denoted, I have separated their occurrence at the different epochs of life, from which it will be seen that 68 per cent. develop before the 30th year, and 32 per cent. after that period :—

Between 10 and 20 years of age . . .	45 cases.
“ 20 “ 30 “ “ . . .	55 “
“ 30 “ 40 “ “ . . .	26 “
“ 40 “ 50 “ “ . . .	11 “
“ 50 “ 60 “ “ . . .	7 “
“ 60 “ 70 “ “ . . .	3 “

Sarcomas of the long bones appear to be influenced in their histological construction by the age at which they appear. With the exception of the central spindle-celled, which are most common after the thirtieth year—the average being the thirty-sixth year—they all develop before that age, the mean being twenty-two for the periosteal osteoid, twenty-three for the periosteal round-celled, twenty-four for the periosteal spindle-celled, twenty-eight for the central round-celled, and a fraction above twenty-eight for the giant-celled.

Traumatism was the assignable cause in nearly one-half of the 144 cases in which the etiology is recorded. They could be traced to blows, falls, kicks, sprains, fractures, and other injuries in

31 out of 60 cases of giant-celled sarcoma.
2 “ 12 “ central round-celled sarcoma.
4 “ 16 “ “ spindle-celled sarcoma.
7 “ 13 “ periosteal round-celled sarcoma.
16 “ 34 “ “ osteoid sarcoma.
3 “ 9 “ “ spindle-celled sarcoma.

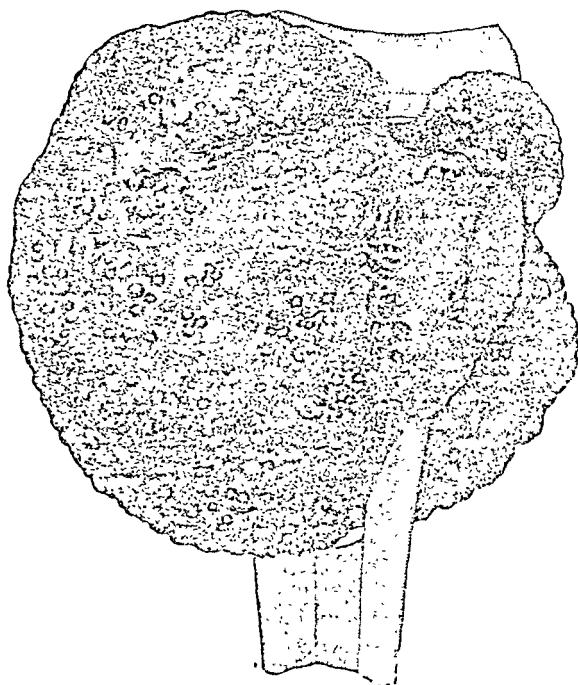
Having thus directed attention to what I consider to be some of the more important points in the general pathology and diagnosis of these new formations, I will now take up the study of the individual sarcomas, in which these data will receive more extended consideration.

### 1. GIANT-CELLED SARCOMA.

Of the central, intraosseous, endosteal, or myelogenic sarcomas of the long bones, by far the most interesting, from their relative frequency,

comparative benignity, and the large size of the cells of which they are mainly composed, are those denominated myeloid tumour by Paget,<sup>1</sup> myeloplaxic tumour by Eugène Nélaton,<sup>2</sup> and giant-celled sarcoma by Virchow.<sup>3</sup> Before the essential elements of these growths were first accurately described by Robin,<sup>4</sup> although they had previously been recognized by Müller<sup>5</sup> and Lebert.<sup>6</sup> giant-celled sarcoma was, in accordance with its external characters or clinical peculiarities, generally ranked under the names of spina ventosa, spleen-like tumour, cancer of bones, fungus hematodes, erectile or aneurismal tumour of bones, spongy tumour, hematoid tumour, encephaloid tumour, and osseous cysts; and even at the

Fig. 1.



present day it is not uncommon for German writers to describe it merely as osteosarcoma. To avoid confusion, I shall refer to it as giant-celled or myeloid sarcoma, as these terms are in common usage.

Of the seventy examples of giant-celled sarcoma, which I have col-

<sup>1</sup> Lectures on Surgical Pathology, 1853.

<sup>2</sup> D'une Nouvelle Espèce de Tumeurs Bénignes des Os, ou Tumeurs à Myéloplaxes. Paris, 1860.

<sup>3</sup> Die Krankhaften Geschwülste, vol. ii. p. 213.

<sup>4</sup> Comptes Rendus de la Soc. de Biologie, 1849, p. 119.

<sup>5</sup> Ueber den feinem Bau und die Formen der Krankhaften Geschwülste, Berlin, 1838, p. 6.

<sup>6</sup> Physiologie Pathologique, T. ii. p. 120, 1845.

lected and analyzed for the purpose of elucidating the structure and general history of this variety of morbid growths, the most remarkable, from its volume, chronicity, and the advanced age at which it occurred, is that illustrated by fig. 1, reduced nearly three-fourths from a specimen which was removed after death, and presented to the Museum of the College of Physicians by Dr. R. E. Brown, of Mount Holly, New Jersey. Its history is as follows :—

I. M. S., 67 years of age, of full, plethoric habit, came under the care of Dr. Brown in December, 1871, on account of loss of muscular power, principally of the right side, which was shortly followed by general erysipelas, from which he succumbed in six weeks from commencement of his illness. During the past twenty-five years of his life Mr. S. had repeated attacks of erysipelas, and chronic ulcers were seated on both legs. Ten years previous to his death, whilst stepping off a street car, he slipped and twisted the left knee, the accident being attended with pain, and succeeded, a few days subsequently, by inflammation, as denoted by slight redness, swelling, and stiffness. At the expiration of six weeks, a soft tumour, as large as a hen's egg, was detected over the anterior and inner aspect of the joint; the discoloration of the integument gradually disappeared, but the pain persisted, although it was never so severe as to demand the use of large doses of opium. The new growth increased very gradually and measured thirty-two inches in its greatest circumference, at the time of the patient's decease. Its surface was hard, inelastic, and nodulated; the skin was somewhat tense, but of a natural hue; the subcutaneous veins were not dilated, nor could any enlargement of the popliteal, femoral, or inguinal glands be detected. The knee was semiflexed, but admitted of limited movement.

The head and upper portion of the shaft of the tibia, which include about two-fifths of the entire bone, form an irregular spherical osseous case, perfect at all points, and covered by the periosteum. The half of the mass from which this description is taken, is divided into three noduled, convex lobes, of which the anterior and largest is limited behind by the insertion of the sartorius muscle, the middle is included between that structure and a deep furrow which corresponds to the inner border of the gastrocnemius, while the posterior lobe is covered by the belly of the latter muscle. The middle lobe terminates above in a prominent spine, into which the semimembranosus muscle is inserted. All of the muscles and tendons that are in relation with the bony capsule are greatly thinned and fatty, while the ligament of the patella is much elongated and expanded into a thin membranous sheet which is merged into the periosteum. The osseous shell varies from  $\frac{1}{16}$ " to  $\frac{1}{2}$ " in diameter, the average being  $\frac{1}{3}$ ", and in the thickest portions are cavities filled with the tissue presently to be described. The great size of the mass may be inferred when it is stated that it is 9" in diameter, and that the distance between the tendon of the sartorius and the middle line is 7", so that the neoplasm grew principally at the expense of the anterior and lateral portions of the head of the tibia. The anterior segment of the articular surface of the tibia forms a deep, hemispherical, or cotyloid depression for the reception of the condyles of the femur, and its investing cartilage is everywhere perfect, although excessively thin. The joint itself is free from disease, but its motions are limited by the greatly

enlarged spinous process. The femur and the remainder of the shaft of the tibia are infiltrated with fat. In its fresh state, the soft portion of the tumour was composed partly of a moderately firm, dark-red tissue, which bore a striking resemblance to coarse muscular fibre which had been exposed to the air, and partly of a dark-red grumous or pulpy substance. Scattered throughout it were numerous cysts or cavities, both single and multilocular, which varied in size from a small hazel-nut to a Sicily orange, were circumscribed by fibrous tissue, and filled, for the most part, with fluid, semifluid, and clotted blood, only a few containing a straw-coloured liquid.

In addition to the large mass, the cancellous tissue of the anterior segment of the shaft of the tibia was occupied by a circumscribed tumour, as large as a pullet's egg, and separated from the original growth and from the medulla of the shaft by a distinct partition. In its recent state, it was of pretty firm consistence, and of a pinkish tint, mottled with spots of crimson and straw color, the pinkish hue being still apparent in the wet section. Anteriorly, the partition is composed of bone, but it is fibrous where it crosses the medullary canal, and is continuous posteriorly with the incurvated shaft of the tibia, which appears as if it had been weighed down by the superincumbent mass. There was no enlargement of the popliteal or femoral glands.

In its gross appearances the tumour, therefore, corresponds with the myelocystic tumour of Mr. Henry Gray,<sup>1</sup> and with the fibroid variety of encysted intraosseous myeloplaxic tumour of Nélaton.<sup>2</sup>

Minute examination of the principal mass failed to disclose the characteristic structure of myeloid sarcoma. Blood corpuscles were found in large numbers, and fibrous and large spindle-celled tissue, along with round and ovoid cells, all in an advanced stage of fatty degeneration, were abundant. In order, if possible, to obtain better sections, I removed, with the saw and knife, a portion of the posterior segment of the tumour, but there was little variation in the constituent elements. The spindle-celled tissue, in the form of interlacing bundles of closely aggregated fusiform cells, was most marked, but giant elements were very decidedly in the minority.

Entirely different from the histological construction of the old tumour was that of the small growth in the shaft of the tibia. This was seen to be a perfect specimen of giant-celled sarcoma, the polynucleated cells constituting the greater portion of the entire structure, and being distributed among a spindle-celled tissue as delineated in Fig. 2, for which I am indebted to my friend Dr. Shakespeare. They were mostly ovoidal and flask-shaped, and contained from three to forty or fifty ovoidal nuclei. In many cells the nuclei were wanting, more or less numerous drops of oil having replaced them.

Myeloid sarcoma is composed of a stroma of spindle and round cells, but particularly the former, in which the characteristic multinucleated elements are imbedded, with the intervention, usually, of little, if any, visible intercellular substance. The tissue has, therefore, an apparently alveolar construction, and its likeness to alveolar structure is the more striking if the cells have undergone mucoid softening, or have become

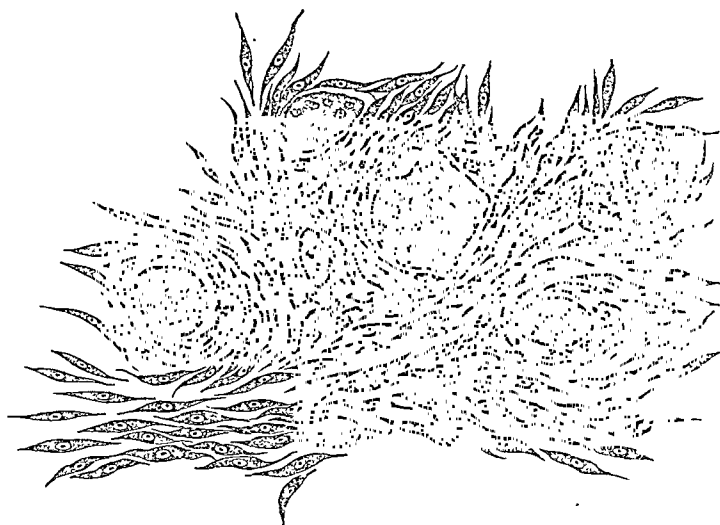
<sup>1</sup> Med.-Chir. Trans., 2d ser. vol. xxi. 1856, p. 121.

<sup>2</sup> Op. cit. p. 256.

obscured by advanced fatty changes. In other examples the intercellular substance is dimly granular, gelatinous, or even fibrous.

The giant-cells themselves, which are synonymous with the mother-cells of Müller and the osteoclasts of Kölliker, are very similar to those found normally in the medulla of growing bones, especially in the spongy substance, where they are present in greatest number on the surface or at the point of contact of the marrow with the osseous tissue. Like the latter, they are made up of finely granular protoplasm, in which many round or ovoid nuclei are contained; but they differ from them in their relatively large size, sometimes reaching the enormous diameter of  $\frac{1}{100}$ " or even  $\frac{1}{50}$ ", in the greater number and clearness of their nuclei, which

Fig. 2.



are rendered more apparent by the addition of acetic acid, and in the variety and oddity of their forms, which it is impossible to describe. The contour of the cells seems to be influenced by the density of the intercellular substance, being irregularly spherical, ovoid, or lobulated, when the latter is soft, and provided with numerous filiform, branched, or clavated processes, through which contiguous cells are occasionally united, when it is fibroid, in consequence of the protoplasm extending itself into the interstices of the fibrillæ. They also not infrequently present a reddish-brown discoloration, to which the peculiar tint of the tumour of which they form a part is in some degree due.

Although, as has been stated, large multinucleated cells are found in the medulla of the spongy substance, and, indeed, in the cambium layer of the periosteum and in a similar layer which lines the central medullary canal<sup>1</sup> of actively growing bones, the origin of these bodies in myeloid sarcoma cannot be referred, as is done by Robin and Nélaton, to a hyperplastic

<sup>1</sup> Dr. M. Fehr, Langenbeck's Archiv, vol. xvii. p. 232.



process or to a numerical increase of preëxisting giant cells. In point of fact the tumours, in the composition of which they are the essential elements, so far from being peculiar to early life, are, as I shall presently show, comparatively rare before the twentieth year, almost four-fifths of the entire number occurring after that age, at which period myeloid cells are seldom, if ever, seen in the epiphyses of the long bones. Mr. Henry Gray<sup>1</sup> states that he has never met with them after the eighteenth and nineteenth years, and in both of these cases their presence seems to have been due to the return of the marrow to its red or foetal state in consequence of disease about the knee-joint. If the cells present in these tumours are the original cells of the medulla, such neoplasms should surely be observed most frequently in subjects of tender years.

In searching for the histological elements from which giant cells originate, it becomes necessary to inquire into the mode of development and growth of myeloid sarcoma. In consequence of irritation, traumatic or otherwise, the marrow of an areola of the spongy substance or of an Haversian canal, reverts to its foetal state. This is accomplished through multiplication of its essential and accessory elements, namely, the medulla cells, the osteoblasts, the cells of the perivascular connective tissue, the multinucleated cells, and the wandering leucocytes, and through the disappearance of the fat from the adipose vesicles. In this way is formed the indifferent, small-celled, or granulation tissue which constitutes the starting point of nearly all neoplasms. In order that space may be made for the increase of the new tissue, the matrix of the bone is softened down, its earthy matters, or mineral salts, are absorbed, the bone corpuscles are set free and added to the proliferating mass, and irregular spaces or cavities, looking as if the bone had been gnawed out, and known as Howship's lacunæ, in which the sarcomatous tissue is contained, result. Along with this increased activity of the cells and the exudation of nutritive fluid, the capillaries proliferate and give rise to new vessels; and so the process goes on, until a well-defined tumour is formed, the textural disturbances being essentially the same as those witnessed in inflammatory osteoporosis or in fungous or rarefying osteitis.

In its further progress the new material increases at the expense of the spongy substance of the epiphysis in which it is developed, until the original bone finally disappears altogether. As the neoplasm approaches the periosteum it irritates that membrane, setting up chronic ossifying periostitis, through which new layers of bone are constantly being produced, precisely as occurs in the physiological peripheral increase of the bones, to encapsule the growth in an osseous shell or case. As the sarcomatous tissue continues to increase within the shell, the same liquefactive changes go on in the newly formed bone, as occurred in the original spongy tissue;

<sup>1</sup> Op. cit., p. 143.

but, as it disappears from within, new osseous layers are simultaneously formed by the osteoblastic layer of the periosteum, and, if the process be slow, deposit of new bone goes on *pari passu* with the absorption of the older layers. \* In this way, as is so strikingly illustrated by the specimen, a more or less perfect osseous capsule is moulded around all central tumours of bone. These histological peculiarities will be best appreciated by a reference to fig. 3, copied from Rindfleisch's *Text-Book of Pathological*

Fig. 3.



*Histology*, which represents, on the one hand, the bony case in the process of continuous formation by fresh accessions from the osteoblastic layer of the periosteum, and, on the other hand, its disappearance on the side of the growing tumour, which is marked by a well-defined tortuous line, along which the multinucleated cells are lying in Howship's lacunæ.

In regard to the specific elements which are concerned in the production of the giant cells, Rindfleisch<sup>1</sup> believes, with Virchow, that they are the bone cells which are set free in the absorption of the osseous tissue, and become hypertrophied through increase of their protoplasm and repeated division of their nuclei. Dr. Oscar Wyss,<sup>2</sup> of Breslau, entertains a similar view, and, further, is of the opinion that the myeloid cells break up into the other cell forms which are found in the neoplasm. Dr. Ziegler,<sup>3</sup> of Würzburg, has traced their production to proliferating bone cells, and believes that they play the part of reserve or unused elements of the tissue which has replaced the bone. In a case of myeloid sarcoma of the con-

<sup>1</sup> Op. cit., pp. 606 and 608.

<sup>2</sup> Virchow's Archiv, vol. xxxv. p. 413.

<sup>3</sup> Virchow's Archiv, vol. lxxiii. pp. 367 and 374.

dyles of the femur, in which the investing cartilage was thinned and implicated in the disease, Mr. Hulke<sup>1</sup> has described and delineated the direct transformation of cartilage cells into giant cells, and a similar change has been observed by Mr. Macnamara in a tumour of the scapula.<sup>2</sup> Wegner,<sup>3</sup> on the other hand, traces their origin to the proliferation of the endothelium of the walls of the bloodvessels, and believes that they may develop into medulla cells, fibrous tissue, or bloodvessels; while in a very recent paper Malassez and Monod regard them as atypical vessel-forming elements, and denominate the tumours in which they are found angio-plastic sarcomas.<sup>4</sup>

While in the present state of our knowledge no objection can be urged against the derivation of giant cells from osteoblasts or the formative cells of bone tissue, medulla cells, the perithelium of the capillaries, or wandering cells, through the multiplication of their nuclei and the increase of their protoplasm, or even from the confluence of the cells of indifferent or granulation material,<sup>5</sup> I am disposed to think that they are nothing more than the liberated and hypertrophied bone cells, in the first place, of the spongy substance in which the growth is developed, and, secondly, of the osseous shell in which it is encased. In fig. 3 the forming and newly formed giant elements are seen so regularly in Howship's lacunæ, along the inner edge of the disappearing bone, that the view of their origin from the bone cells is most alluring.

In support of this opinion reference may be made to the physiological occurrence of giant cells in the developing marrow of young bones, which is, as is well known, formed after the osseous tissue. According to Bredechin<sup>6</sup> and other observers the formation of the medullary cavities is coincident with the absorption of the calcified matrix and the release of the bone cells, which are converted into giant elements. Kölliker<sup>7</sup> has not only confirmed these investigations, but he has shown that myeloid elements are present in and on bones at points where they have been subjected to pressure, hence he terms them osteoclasts, osteophagi, or bone-destroyers, and thinks that they are transformed osteoblasts. Wegner also believes that pressure is the principal condition for the development of giant cells, and he has found them on the dura mater, where it is in contact with the inner surface of the skull, in tumours of the brain, and in hydrocephalus, and on the sacs of aneurisms which had produced absorption of the ribs and vertebræ. I have myself met with them in periosteal

<sup>1</sup> Archives of Medicine, vol. i. p. 110, and plate 13, fig. 4.

<sup>2</sup> Clinical Lectures on Diseases of Bone, London, 1878, p. 240.

<sup>3</sup> Virchow's Archiv, vol. lvi. p. 523.

<sup>4</sup> Arch. de Phys. Nor. et Path., ser. 2, vol. v. 1878, p. 375.

<sup>5</sup> Giovanni Weiss. Virchow's Archiv, vol. lxxviii. p. 59.

<sup>6</sup> Centralblatt für die Medicin. Wissenschaften, 1868, p. 563.

<sup>7</sup> Verhandl. der Würzb. Physik. Med. Gesellschaft, 1872, vol. ii. p. 4.

sarcomas, attended with slight erosion of the shafts of the long bones, although they were not present in other parts of the neoplasms; and their absence from peripheral sarcomas may be ascribed to the fact that the bones upon which they are seated are not constantly disappearing, as is the case in the central tumours. Rustizky<sup>1</sup> has arrived at similar conclusions, although he does not believe that the absorption of bone is necessarily attended with the production of giant cells. Finally, it may be mentioned that multinucleated elements are found on the provisional or periosteal callus of fractured bones, in caries, necrosis, rarefying osteitis,<sup>2</sup> in the dentine of deciduous teeth, and in granulations growing into bone.

A very striking illustration of the derivation of myeloid from bone cells is afforded by a case of sarcoma reported by Bousseau,<sup>3</sup> in a man of sixty, in which a red, denuded, bosselated, and very firm tumour, as large as the fist, seated on the exterior of the head of the tibia, communicated by a narrow pedicle with a mass within the bone. The latter contained large numbers of giant cells imbedded in fusiform and round cells, while the former was composed entirely of spindle-celled tissue.

From the preceding considerations, the pathological significance of giant cells and their relation to the central sarcomata are very evident. Originating as they do from the bone cells, to constitute a myeloid tumour, they should be present not only at the circumference, but throughout the entire neoplasm, since, in its onward progress, osseous tissue has constantly been absorbed. Hence, as Rustizky states, they merely indicate that bone was a constituent of the matricular tissue of the new growth. On this account, periosteal sarcomas, which contain only a few giant cells at their points of contact with the shafts of the long bones, can readily be distinguished from the true myeloid sarcomas which start from the medulla.

In shape, giant-celled sarcomas are usually spherical or ovoid. Their surface is commonly smooth and regular, although it may be uneven, bosselated, or lowly-lobed, or it may be divided into large nodulated lobes by deep grooves, in which the adjacent muscles, tendons, nerves, and blood-vessels lie. They are distinctly circumscribed, and isolated from the surrounding tissues by an investing capsule, composed of periosteum or of bone, or of both of these tissues. In the majority of cases the cyst is partly bony and partly membranous; in a large number it is entirely periosteal, while, in about sixteen per cent. of all specimens, it forms a perfect osseous shell—the mode of formation of which has already been described—which is commonly thin, delicate, fragile, and crepitant under slight pressure,

<sup>1</sup> Virchow's Archiv, vol. lxi. p. 202.

<sup>2</sup> See a paper by Professor Koenig, of Rostock, entitled "Der Vorgang der Rarefizierende Ostitis unter der Einwirkung der Riesenzellen" (*Deutsche Zeitschrift für Chirurgie*, 1873, p. 502).

<sup>3</sup> *Bulletins de la Société Anatomique de Paris*, 2 ser., vol. xii. 1867, pp. 426 and 640.

although, as in the example here recorded, it may attain the thickness of half an inch, and contain cavities filled with sarcomatous tissue.<sup>1</sup> Instead of presenting itself in its usual form of fibrous tissue interspersed with plates of bone, one-half of the capsule may be osseous and the other half membranous; as, for example, in a tumour of the head of the tibia, the upper half of the cyst was made up of the thinned articular cartilage and the periosteum, and the lower half of osseous tissue which was continuous with the shaft of the bone. The relation of the capsule to the surrounding parts is usually very simple, the muscles and other soft structures being merely stretched, thinned, or, perhaps, the seat of fatty changes. Now and then the sheaths of the tendons are converted into thin bony canals, as in a case under the care of Langenbeck,<sup>2</sup> or the tendons, covered by normal synovial membrane, glide in bony canals developed in the osseous shell, as in the case of Larrey.<sup>3</sup> In a unique instance of myeloid tumour of the head of the tibia, recorded by Cadiat,<sup>4</sup> "a species of vast serous burse" isolated the growth from the adjacent tissues.

On section, the epiphysis of a long bone looks as if it had been replaced by a mass of soft structure, surrounded by a capsule, which is continuous, on the one hand, with the articular cartilage, and, on the other hand, with the periosteum of the shaft, the latter of which terminates abruptly in the midst of the tumour, although, in rare cases, the medulla of the shaft and the neoplasm are separated by a plate or plug of new bone.<sup>5</sup>

The tissue of the tumour itself presents such peculiar appearances that there is usually little difficulty in recognizing myeloid sarcoma with the naked eye. The cut surfaces, in typical specimens, in which the cellular elements have not undergone retrograde changes, are, especially in the more recent portions of the growth, of a uniform dark red, reddish-brown, or maroon colour, not unlike that of coarse muscular fibre which has been exposed to the action of the air, or resembling the tissue of the heart, or the splenic pulp. In other examples, and these are the most common, the tint is rosaceous, pink, or reddish-buff, mottled with spots or blotches of crimson, bright-red, cherry, or dark-brown. When fatty degeneration is far advanced, and this is not infrequent, the material is of an amber, yellowish-white, or light-buff hue, with points of deep-red or crimson colour, or between the pale-yellow or straw tints and the crimson, there are many intermediate shades, thereby producing a remarkable marbled aspect. Now and then the predominant colour is grayish, pearly, glistening, or semitransparent, in which event a large admixture of spindle-

<sup>1</sup> Mr. Borlase Childs has reported analogous appearances. Trans. Path. Soc. of London, vol. vii. p. 362.

<sup>2</sup> Langenbeck's Archiv., vol. i. p. 143.

<sup>3</sup> Nélaton, op. cit., Obs. xlv.

<sup>4</sup> Bulletins de la Société Anatomique de Paris, ser. 3, vol. viii. p. 372.

<sup>5</sup> Cadiat, op. cit.; Brodie, Med.-Chir. Trans., vol. xxxix. case 3, p. 129; and page 28 of this paper.

celled or fibrous tissue may be looked for. In all specimens there are yellow areas, which indicate fatty degeneration. These areas may surround the more darkly coloured spots, or a large yellow patch may exist in the centre of the dark-red mass.

Giant-celled sarcomas vary very much in their consistence, the majority possessing that of muscular tissue, although they are easily crushed, while others are soft and pulpy. The firmer forms owe their consistence to young or mature fibrous tissue, while the softer forms find their explanation in fatty transformation.

They are not so vascular as one might be led to expect from their more or less rapid growth, large size, and the interstitial hemorrhages to which they are so liable. As a rule, no large arteries enter, and no large veins emerge from, the tumour, so that the circulation is essentially capillary. In exceptional cases, however, the development of bloodvessels is so excessive, that the tissue seems to be saturated with blood, or is the seat of extensive extravasations, for which reason the term fungus hematodes has been applied to them. The vessels, indeed, may be so large as to impart pulsation to the mass, whence the names telangiectatic sarcoma and aneurism of bone, although, in the majority of the pulsating myeloid sarcomas, the vessels are either so slightly developed as to escape comment,<sup>1</sup> or, under minute examination, they are not numerous.<sup>2</sup> In other examples a large number of small arteries inosculate on the interior of the osteo-fibrous capsule,<sup>3</sup> or the latter is lined by an extremely rich vascular network;<sup>4</sup> or a plexus of capillaries, the walls of which have undergone sarcomatous degeneration, is present in the fibrous bands which intersect the tumour.<sup>5</sup> In these pulsating tumours, future and more accurate observations will, doubtless, disclose that their vessels are almost always enlarged, varicose, and brittle, and that their adventitia is the seat of small-celled infiltration, as in the case recorded by Labbé.

When they are once fully formed, giant-celled sarcomas exhibit a great proneness to undergo certain metamorphoses, some of which indicate progressive changes, or attempts to develop into the different varieties of mature connective tissue, while others represent retrogressive metamorphoses, due to impairment of the nutrition of their component elements. These secondary conditions of involution, and abortive efforts towards the formation of higher tissues, have led certain writers to constitute varieties

<sup>1</sup> Billroth, *Chirurgische Klinik*, Wien, 1869-70, p. 367; Godlee, *Trans. Path. Soc. London*, vol. xxv. p. 202; Langston Parker, *Med. Chir. Trans.*, vol. xxxix. p. 138; Langenbeck, *Langenbeck's Archiv.*, vol. xxi. Supp. p. 331, and Carville, *Bull. Soc. Anat. de Paris*, ser. 2, vol. xii. p. 475.

<sup>2</sup> Chassaignac, Nélaton, *Obs.* xxxv., and Lücke, *Virchow's Archiv.*, vol. xlv. p. 322.

<sup>3</sup> Robin, Nélaton, *Obs.* xxi.

<sup>4</sup> Sirus-Pirondi, *Ibid.*, *Obs.* xxxvii.

<sup>5</sup> Labbé, *Bull. de la Soc. Anat.*, 2d ser., vol. x. p. 230.

of myeloid sarcoma, as the fatty, cystic, telangiectatic, hemorrhagic, fibrous, calcifying, ossifying, and chondroid, to which there can be no objection, provided these terms be merely employed as prefixes to indicate the nature of the changes that have ensued or designate the existence of certain subordinate tissues.

Of the retrograde changes, by far the most constant and important is fatty degeneration, which manifests itself by the presence of minute granules of fat and drops of oil in the cells, through which they are rendered obscure, and finally converted into granular corpuscles, which disintegrate and disseminate their contents into the intercellular substance. To this change may be ascribed the softness and the creamy, light buff, yellowish-white, amber, or orange-yellow tints of the morbid mass; and to it, in connection with deficient vascular supply, may be referred the yellowish friable nodules which are, occasionally scattered through the neoplasm, and which represent the cheesy form of fatty metamorphosis. As still further consequences of fatty changes, the granular corpuscles liquefy and form retention cysts, and hemorrhage is liable to occur from implication of the capillary vessels.

One of the most striking peculiarities of these tumours is the formation of cysts or cystoid spaces, both simple and multilocular, which vary in size from a millet-seed to a fist, and are occupied by fluid, semifluid, or clotted blood, fatty emulsion, or sanguinolent, or clear serous fluid. Their number may be so great as to have replaced almost entirely the original texture, so that the specimen under inspection conveys the impression of being one of cystic disease of the bone. It is to this form of giant-celled sarcoma that Mr. Henry Gray<sup>1</sup> applied the name myelocystic tumour. They are not, however, true cysts, lined by a secreting membrane, but rather irregular spaces or cavities, the walls of which are composed of fibrillated tissue studded with granular fat and drops of oil, and presenting more or less distinct traces of degenerated giant cells, and occasionally stained of a deep orange colour by crystals of hæmatoidin. Their origin is distinctly due either to disintegration and liquefaction, or mucoid softening, of the elements which have undergone fatty metamorphosis, or to extravasations of blood in the softened fatty areas from rupture of the enlarged and degenerated vessels. In the former event, the softening cysts contain turbid, opaque, buff-coloured fluid, or a straw-coloured serosity; while, in the latter mode of formation, the extravasation cysts are filled with blood or coagula, or, in the event of the absorption of the solid constituents of the blood, with a sanguinolent fluid.<sup>2</sup>

In connection with extravasation cysts, reference may again be made to the vascularity of these tumours. That newly-formed vessels are some-

<sup>1</sup> Med. Chir. Trans., vol. xxxix. p. 121.

<sup>2</sup> The mode of formation of these cysts has been carefully studied by Dr. Bristowe, Trans. Path. Soc. Lond., vol. vii. p. 370.

times present in enormous numbers, and are much dilated, and that they easily rupture and give rise to considerable interstitial bleedings, is shown by the foregoing considerations, and by the fact that not a few of these tumours have been confounded with aneurism, whence their various names telangiectatic and hemorrhagic sarcoma,<sup>1</sup> hematoma, fungus hematodes, and aneurism of bones. In the majority of the ten examples of giant-celled sarcoma, previously alluded to, in which the pulsation was due to inherent changes and not to overlying arteries, the mass of the tumour was converted into cysts filled with blood in various stages of consistence, but principally in the form of black clots or a syrupy fluid. In the case of Lücke, however, in which, in addition to expansile pulsation, there was a short systolic murmur that disappeared on compression of the femoral artery, through which the volume of the tumour was also diminished, there were no cysts, the material of which the growth was composed being soft, smooth, and marked with clear red spots, and fed by a moderate number of large vessels. From these reflections, and from the fact that the earlier recorded cases of aneurism of bone consisted of a large sac filled with fluid or clotted blood, I am disposed to believe with Nélaton,<sup>2</sup> Volkmann,<sup>3</sup> and Lücke,<sup>4</sup> that the vast majority of so-called aneurisms of bone are nothing more than pulsating giant-celled sarcomas, if not with Virchow,<sup>5</sup> Landi,<sup>6</sup> and Broca,<sup>7</sup> that such an affection does not exist.

In the firmer forms of tumour, or in fibrous myeloid sarcomas, it is not uncommon to meet with irregular masses of a dense, translucent, grayish-white, glistening character, which are made up of large fusiform elements or of interlacing bands of fibrous tissue. In other examples, the appearances are very similar to those presented by a section of the spleen, fibrous trabeculae being given off from the inner surface of the capsule, which, by their union, constitute an areolar framework, in the interstices of which the brownish-red characteristic material of the growth is contained.

Calcification and ossification of giant-celled sarcomas are far less frequent than in peripheral sarcomas, being present in only twenty per cent. of all cases; but these changes are singularly interesting from the fact, as I shall have occasion to show, of their occurring in the majority of the growths which present malignant features, and which, on that account, are very analogous to the ossifying periosteal sarcomas of the shafts of the long bones. Respecting these changes, it is only necessary to say that calcification is far more common than ossification, true bone being rarely

<sup>1</sup> Virchow, *op. cit.*, p. 190.

<sup>2</sup> *Op. cit.*, p. 230.

<sup>3</sup> Pitha and Billroth's *Handbuch der Allg. und Spec. Chirurgie*, Bd. 2, Abth. 2, Lief. 1, p. 477.

<sup>4</sup> *Ibid.*, Bd. 2, Abth. I. Heft 2, p. 200.

<sup>5</sup> *Op. cit.*, vol. iv. p. 68, French translation.

<sup>6</sup> *Amer. Journ. Med. Sciences*, January, 1878, p. 278.

<sup>7</sup> *Traité des Tumeurs*, vol. ii. p. 212, 1869.



encountered, while the deposition of the earthy salts in the intercellular substance, and to a less extent in the cells, is the rule. In sections of tumours undergoing these changes, numerous rough or sharp points can be both seen and felt, and minute examination usually discloses opaque, black, roundish molecules irregularly interspersed through the soft tissue, or forming a network in which the cellular elements are contained. In some specimens bony spicules penetrate the tumour in every direction, and even supply in part the place of the original bone. Thus, in the case of Lawrence,<sup>1</sup> the tibia, which had disappeared for five or six inches, was substituted by a framework of osseous fibres and plates, which traversed the bony sac in all directions, and connected the articular cartilage of the tibia with the lower portion of that bone. In other examples, osseous plates are inclosed in fibrous bands, and the walls of the cysts may even be partially ossified. Again, isolated fragments of what is apparently spongy bone are scattered throughout the tumour, or one-half of the growth may be composed of a dense calcareous mass, while the other half is sarcomatous. Finally, as in the case of Berend,<sup>2</sup> the neoplasm may be constituted by a series of nodosities or lobes, each of which is surrounded by a more or less perfect osseous capsule containing a red tissue.

The occurrence of cartilage in myeloid sarcomas is relatively infrequent; but this combination has been observed by Gray,<sup>3</sup> Paget,<sup>4</sup> Meckel,<sup>5</sup> and others, in the form of small plates, although rarely in sufficient quantity to justify the prefix chondroid.

Inflammation of these growths may be ranked among pathological curiosities. Mr. Little<sup>6</sup> has recorded a case in which an abscess opened over the outer condyle, and was found, after amputation, to communicate with a cavity, partially filled with pus, in the interior of the mass. In a case, occurring in the practice of Langenbeck,<sup>7</sup> there was a fistulous opening in the reddened skin, through which a probe could be passed into the tumour, which occupied the lower end of the radius.

Giant-celled sarcomas of the long bones are most frequent in the lower extremity, and they are almost exclusively confined to the epiphyses. Thus, of 70 recorded examples, the seat of the tumour was in the

<sup>1</sup> Med.-Chir. Trans., vol. xvii. p. 35, and vol. xxxix. p. 133.

<sup>2</sup> Virchow, *op. cit.*, p. 323.

<sup>3</sup> *Op. cit.*, p. 138.

<sup>4</sup> *Op. cit.*, 3d ed. p. 528.

<sup>5</sup> Charité-Annalen, vii. p. 93, 1856.

<sup>6</sup> Trans. Path. Soc. Lond., vol. xiv. p. 245.

<sup>7</sup> Langenbeck's Archiv, vol. i. p. 143, case 2.

Tibia, upper epiphysis, in 21 cases, lower epiphysis, in 2 cases	
Femur, " " " 2 " " " " 17 "	
Fibula, " " " 7 " " " " 2 "	
Humerus, " " " 5 " " " " 1 "	
Radius, " " " " " " " " 5 "	
Ulna, " " " 1 " " " " 3 "	
Femur, <sup>1</sup> shaft	2
Humerus, <sup>2</sup> shaft	1
Radius, <sup>3</sup> shaft 1.	

These localities show that the medulla of the spongy substance of the articular extremities, and not the medulla of the diaphyses, is the favourite tissue for their development.

They are only slightly more common in men than in women. Of 63 cases, in which the sex is known, 33 occurred in males, and 30 in females.

They do not appear to be inherited; are not met with during infancy and childhood; are not very common during adolescence; their greatest frequency is during the age of maturity, or from 21 to 40 years; while their occurrence is rare during middle and old age. The age at which the affection was first noticed is given in 60 cases, the youngest being 14,<sup>4</sup> and the oldest years 68,<sup>5</sup> the sum of the ages equalling 1694 years, making the mean age of its appearance 28.2. These facts are set forth in the following table:—

Age.	No. of Cases.
10 to 20 . . . . .	14
20 " 30 . . . . .	26
30 " 40 . . . . .	12
40 " 50 . . . . .	3
50 " 60 . . . . .	4
60 " 70 . . . . .	1
	<hr/> 60

Thirty-one subjects recognized previous injury or disease as the exciting causes of the affection. In six instances it was ascribed to blows, in fifteen to falls, in three to sprains, in one to luxation and fracture, in one

<sup>1</sup> Bryant, Trans. Path. Soc., Lond., vol. viii. p. 387, in a lad, æt. 15; the epiphysis was not yet united to the shaft; Peulevé, Bull. Soc. Anat., 2d ser., vol. x. p. 658, in a woman of 54.

<sup>2</sup> Bristowe, Trans. Path. Soc., Lond., vol. vii. p. 351, in a boy, æt. 18; the shaft and upper epiphysis not yet united.

<sup>3</sup> Bryant, The Practice of Surgery, Phila. 1879, p. 873.

<sup>4</sup> Cadiat, Bull. Soc. Anat., ser. 3, vol. viii. p. 372.

<sup>5</sup> As the occurrence of this growth after the 39th year is interesting, the following references and ages are considered worthy of record. Thompson, Trans. Path. Soc., vol. x. p. 237, at 68; Brown, see p. 27 of this paper, at 57; Carville, Bull. Soc. Anat., ser. 2, vol. xii. p. 475, at 55; Peulevé, Ibid. ser. 2, vol. x. p. 658, at 54; Ferguson, Trans. Path. Soc., vol. xx. p. 278, at 51; Henry, Ibid. vol. ix. p. 367, at 41; Hulke, Archives of Medicine, vol. i. p. 110, at 41; and Langenbeck, Langenbeck's Archiv, vol. i. p. 143, case 2, at 40.

to fracture alone, in one to a strain in throwing a stone, in one to a kick, and in three to rheumatism. In the majority of these cases the influence of the injury upon the development of the neoplasm is unmistakable. The general health of the subjects was, with few exceptions, good.

Myeloid sarcomas, as a rule, grow more slowly than the other varieties of sarcoma of the long bones, although when they are compared with each other, some are observed to attain a large size in a comparatively short period. For purposes of comparing the rate of increase, tumours occupying the same situation may be selected. Thus, in the head of the humerus, the growth may be as large as two fists in twelve months, or as a child's head in five years, or have a circumference of twenty-eight inches in thirty months, or of thirty-two inches in ten years; in the lower epiphysis of the femur it may acquire a circumference of twenty inches in two years, or a circumference of twenty-six inches in six years; in the lower end of the radius, a diameter of two inches and a half in six months, or a diameter of five inches in ten years. In the last example, the tumour which attained a diameter of two inches and a half was growing ten times more rapidly than the one which was ten years in reaching a diameter of five inches. In the largest tumours both extravasation and exudation cysts are generally met with; but neither the rate of growth nor the volume depends upon these retrograde changes, as might naturally be expected, since it is in just these cases of rapid growth that the texture of the tumour is firm and typical. Certain conditions do, however, favour their increase. Among these are injuries, such as blows, or falls, or even exploratory punctures, or friction with liniments, pregnancy and nursing, of which latter states examples are furnished by Lawrence<sup>1</sup> and Langenbeck.<sup>2</sup>

Their growth is progressive or continuous, but in about six per cent. of all cases, it is temporarily arrested. Of this occurrence, the most noteworthy example is recorded by Mr. Hutchinson,<sup>3</sup> in which a tumour of the head of the humerus, after having acquired about two-thirds of the volume of an infant's head in fourteen months, ceased to grow for four years, when, without obvious cause, it renewed its activity.

During their entire progress, giant-celled sarcomas generally exhibit no tendency to break through their limiting capsules, hence their influence on the surrounding tissues is almost purely mechanical, the overlying and associated structures being, as previously indicated, stretched and attenuated, and not incorporated with the tumour, or implicated by extension of the disease. The skin almost invariably preserves its mobility and natural tint; the subcutaneous veins are usually not enlarged; the muscles, tendons, ligaments, and other soft structures are extended, and, perhaps, displaced; the contiguous bones, as, for example, the fibula when the tibia

<sup>1</sup> Med. Chir. Trans., vol. xvii. p. 35

<sup>2</sup> Langenbeck's Archiv, vol. xx. sup. pp. 329-331.

<sup>3</sup> Trans. Path. Soc., Lond., vol. viii. p. 346.

is affected, are occasionally bent, or slightly eroded, or even absorbed;<sup>1</sup> the joints are commonly not implicated, and the medulla of the shafts of the bones which terminate in the tumour, and the lymphatic glands and distant organs are, as a rule, free from secondary or metastatic deposits.

To these general statements there are exceptions, some of which are notable.

α. The skin is usually discoloured, thin, glossy, and tense, now and then thickened by hyperplastic processes, and not by infiltration with the elements of the tumour, but very rarely adherent or ulcerated, unless as the result of traumatism or exploratory puncture. The subcutaneous veins, which, as a rule, are not enlarged, are greatly dilated in twenty-seven per cent. of all cases.

β. The fibres of the adjacent muscles are liable to become adherent to the mass and to be the seat of fatty, fibroid, and possibly hyaline changes. Occasionally, but particularly when the investing capsule of the growth has been perforated, the fasciculi are separated by nodules of sarcomatous tissue,<sup>2</sup> and, in a case of Cohnheim,<sup>3</sup> at the point of contact of the tubers, were zones of a bright red colour, which consisted not only of round and fusiform cells, but also of very numerous and exquisitely developed giant cells, which were, moreover, detected in the intermuscular connective tissue at a distance of four millimetres from the tubers. This is the best example of local infection on record. In the case of Bristowe,<sup>4</sup> the intermuscular veins of the deltoid were enlarged and distended by a pulpy tissue, which presented the same minute characters as the tumour itself.

γ. The contiguous bones show little proneness to invasion, the only examples of this occurrence that I have discovered being the following:—

A farmer, aged 36 years, presented himself at the clinic of the Jefferson Medical College, June 16th, 1876, on account of a huge tumour of the left humerus, of an elongated globular shape, elastic at points, and the seat of parchment crackling at others, but generally hard from the presence of a dense bony capsule. Its greatest circumference was twenty-eight inches, against eleven inches at the corresponding point of the sound limb, and it extended from two inches above the condyles to two inches above the level of the shoulder. The skin was tightly stretched over the mass, but it was mobile and free from discoloration; and a few of the subcutaneous veins were enlarged. The neighbouring lymphatic glands were sound, and the general health was excellent. Attention was first called to the trouble twenty-nine months previous to his admission, by fracture of the humerus two inches below the joint, which was at once followed by the appearance of the tumour. On disarticulation at the shoulder, by Professor Gross, the upper portion of the axillary border of the scapula had to be extensively gouged away, and the origins of the muscles cut off, in consequence of their involvement by the material of the new growth.

<sup>1</sup> Bennett, Dublin Journ. Med. Sci., Sept. 1, 1877, p. 427.

<sup>2</sup> Langenbeck's Archiv, vol. i. p. 141, case 5.

<sup>3</sup> Virchow's Archiv, vol. xl. p. 286.

<sup>4</sup> Trans. Path. Soc., Lond., vol. vii. p. 354.

In the case of Berend, recorded by Virchow,<sup>1</sup> the disease was propagated from the head of the fibula to the head of the tibia; and in that of Langenbeck,<sup>2</sup> a nodule was discovered in the spongy tissue of the humerus, after total resection of the elbow-joint for a giant-celled sarcoma of the upper extremity of the ulna.

δ. Notwithstanding the fact that the shaft of the bone usually terminates abruptly in the tumour, its exposed medulla is singularly free from implication, thereby forming a striking contrast with the deposits in the marrow found in connection with periosteal sarcomas. Among the few instances of infiltration of the medulla, that recorded by Sir Benjamin Brodie, and examined by Mr. Gray,<sup>3</sup> is worthy of mention.

ε. The adjacent articulation occasionally undergoes destructive changes from nutritive disturbances, as has been witnessed by Carville,<sup>4</sup> Ledentu,<sup>5</sup> and Langenbeck;<sup>6</sup> but the investing cartilages of the epiphyses appear almost constantly to oppose a barrier to encroachment on the joint, although they are much thinned and form part of the capsule. That they may, in opposition to the earlier statements on this point, be perforated, is attested by at least two examples. Thus, in the case of Sir Benjamin Brodie,<sup>7</sup> "the articular surface of the condyles had been entirely absorbed, and the morbid growth had made its way into the cavity of the knee-joint, which it distended throughout, pushing the patella and its ligament forward, absorbing the cartilaginous surface of that bone, and making its way into the cancellous tissue. The cartilage covering the head of the tibia had the growth adhering to it in some parts, whilst in others the cartilage had been absorbed, and the morbid structure had made its way into the cancellous tissue of this bone, but only to a very slight extent." In the case recorded by Mr. Moseley<sup>8</sup> the cartilage was "perforated, but the joint was but slightly affected."

In the majority of examples of implication of the neighbouring joint, however, the cartilage of incrustation remains whole. In the case of Dr. L. A. Stimson,<sup>9</sup> of New York, the tumour had "broken through the intercondyloid notch, and sent a bony column, half an inch in diameter, between the crucial ligaments, down to the anterior edge of the articular surface of the tibia." The capsule of the joint was also perforated, and the neoplasm surrounded the patella and eroded its anterior surface. In the remarkable instance of calcifying giant-celled sarcoma of the head of

<sup>1</sup> Op. cit., pp. 323 and 337.

<sup>2</sup> Langenbeck's Archiv, vol. xxi. sup. p. 329.

<sup>3</sup> Med. Chir. Trans., vol. xxxix. p. 128.

<sup>4</sup> Bull. Soc. Anat., 2d ser., vol. xii. p. 475.

<sup>5</sup> Ibid., 2d ser., vol. ix. p. 515.

<sup>6</sup> Langenbeck's Archiv, vol. xxi. sup. p. 329.

<sup>7</sup> Med. Chir. Trans., vol. xxxix. p. 131.

<sup>8</sup> Trans. Path. Soc., Lond., vol. xx. p. 281.

<sup>9</sup> The Medical Record, Jan. 6th, 1877, p. 11.

the tibia, reported by Mr. Butlin,<sup>1</sup> the crucial ligaments were converted into a firm calcified mass, and the disease was propagated through them into the lower portion of the femur, which, however, was only slightly affected. In the remaining instances of invasion of the joints the reports are as follows: "In the notch between the condyles, the tumour formed one or two gelatinous prominences into the joint behind the synovial membrane."<sup>2</sup> Projecting into the knee-joint from the internal condyle, and covered only with the thinnest film of articular cartilage, was a bluish growth, looking like a venous naevus;<sup>3</sup> and "the synovial cavity was also entirely occupied by the growth which filled the space between the articulating surfaces of the femur and tibia."<sup>4</sup>

The above seven examples demonstrate that a more extended examination does not confirm the positive assertion of Mr. Erichsen,<sup>5</sup> who says: "It is a remarkable fact, long ago pointed out by Petit, and more recently insisted on by Richet, and which I have often had occasion to verify, that, although the epiphysis may have been completely degenerated, the cartilage of incrustation and the neighbouring joint never becomes implicated."

ζ. Of extreme interest, from a pathological as well as a practical point of view, is the condition of the lymphatic glands directly connected with the tumour, which are stated to have been hypertrophied in only eight instances. In two, in which further histories are wanting, and in which the structure of the glands appears to have escaped notice, these organs were involved; in the first,<sup>6</sup> one gland in the groin was hypertrophied, and, in the second,<sup>7</sup> both groins were affected, but to a greater extent on the side corresponding to the tumour, the gland being of "the size of a crown-piece and spongy to the touch." In six examples the glands were merely enlarged from irritation. In that recorded by Dr. E. H. Bennett,<sup>8</sup> a gland over the saphenous opening diminished at least one-third after amputation, from which the patient recovered. On dissection of the limb, some enlarged glands were discovered in the popliteal space, which were found to contain only normal elements. In the case described by Mr. Godlee,<sup>9</sup> which also recovered, one or two glands in the groin were decidedly smaller two months after amputation. In the instance of Mr. Little,<sup>10</sup> the glands in the groin subsided after amputation, and recovery

<sup>1</sup> St. Bartholomew's Hosp. Rep's, vol. x. p. 121. Mr. Butlin records this case as being one of round-celled sarcoma; but the slow progress of the disease, and the minute examination, which showed it to be "for the most part round-celled, but containing not a few myeloid cells," have led me to include it among the giant-celled growths.

<sup>2</sup> Godlee, Trans. Path. Soc., Lond., vol. xx. p. 202.

<sup>3</sup> Hulke, ante.

<sup>4</sup> Sydney Jones, Trans. Path. Soc., Lond., vol. x. p. 246.

<sup>5</sup> The Science and Art of Surgery, Phila. 1878, vol. ii. p. 208.

<sup>6</sup> Brichetau, Bull. Soc. Anat., 2d ser., vol. 3, p. 470.

<sup>7</sup> Moseley, ante.

<sup>8</sup> Ante.

<sup>9</sup> Ante.

<sup>10</sup> Ante.

followed. The popliteal glands, which were found to be hypertrophied on inspection of the limb, were simply hyperplastic. In the case of Chassaig-nac,<sup>1</sup> the enlarged glands in the groin gradually diminished after amputation, and the man was alive four years subsequently. In the case of Mr. Hutchinson,<sup>2</sup> which, as will be presently seen, was remarkable for being an instance of local return and general infection, the infra-axillary glands formed a mass as large as the fist; but they were merely loosely connected with each other and with the surrounding tissues, and only showed "microscopical indications of hypertrophy and inflammatory conditions." Finally, in the case of Mr. Butlin,<sup>3</sup> the enlarged and tender femoral glands had subsided to nearly their normal size one month after successful operation. The absence of sarcomatous elements from the glands submitted to minute inspection; their diminution or disappearance after operation; the non-occurrence of periadenitis, through which they remain isolable and unattached to the connective tissue in which they are imbedded; their freedom from ulceration, and their non-involvement in four other examples of general dissemination of the disease, are facts that lead to the conclusions that, in giant-celled sarcoma, glandular enlargement is the effect of irritation and not of specific infiltration, and that systemic infection takes place through the vascular, and not through the lymphatic, system.

Like the other varieties of sarcoma of the long bones, myeloid tumours are, therefore, occasionally locally infectious, as is evinced by the invasion of their own osseous capsules,<sup>4</sup> the contiguous bones and joints, and the surrounding soft tissues.

7. Giant-celled sarcomas, as a rule, are confined to the parts in which they originate and grow; but they sometimes recur after removal, and even exhibit more marked signs of malignity, by forming metastatic or secondary tumours in distant organs. As Nélaton, Gray, and other writers are disposed to regard them as being habitually of a benign character, I shall offer no apology for giving abstracts of the recorded cases of generalization, from which it will be observed that no doubt can be entertained of their not very infrequent malignant nature.

CASE I. Dr. Stimson<sup>5</sup> amputated the thigh of a man, aged 37 years, on the 31st of November, 1876, on account of myeloid sarcoma of the lower epiphysis of the femur, of ten months' standing. The tumour, which had invaded the knee-joint, was composed of round and fusiform cells, and "of large quantities of myeloplaxes, especially near the points of ossification." In about eight weeks, the patient began to cough and spit blood, and some weeks subsequently a hard, flat tumour appeared on the left frontal bone.

<sup>1</sup> Nélaton, *op. cit.*, Obs. xxxvi. and *Gazette des Hôpitaux*, 1863, p. 25.

<sup>2</sup> *Trans. Path. Soc., Lond.*, viii. pp. 351 and 355.

<sup>3</sup> *Ante.*

<sup>4</sup> *Vide page 27, and Trans. Path. Soc., London*, vol. vii. p. 362.

<sup>5</sup> *The Medical Record*, vol. xii. 1877, pp. 11 and 524.

Death ensued on May 4, 1877, or five months and a half after the operation, when the lungs were found to be filled with nodules, varying in size from a cherry to a child's fist, which were composed of round and fusiform cells. In a few there were calcareous deposits; while a piece of fully-formed bone, an inch in diameter and one-third of an inch thick, was found in the largest nodule. The frontal bone was occupied by an ossifying sarcoma;<sup>1</sup> and three ossifying minute red growths were seated on the under surface of the dura mater where it was adherent to the frontal tumour, which were made up of similar elements. The lymphatic glands, the remaining viscera, and the stump were free from disease.

CASE II.<sup>2</sup> A labourer, 30 years of age, underwent amputation of the thigh, Oct. 7, 1856, for a typical giant-celled sarcoma of the head of the fibula, of seven months' duration. In two years, or on Oct. 20, 1858, he returned to the hospital with a tumour, as large as the closed fist, on the inner side of the thigh, and two smaller ones on the outer side, all of which, were found to consist of myeloid tissue, contained in thick, and partly bony, capsules, which were not connected with the femur. On death from acute pleurisy, Nov. 26, Dr. Wilks found three or four pendulous giant-celled tumours, one of which was as large as the heart, growing from the surface of each lung, and looking like supernumerary lobes. The lymphatic glands, and all of the other organs were healthy.

CASE III.<sup>3</sup> A rheumatic woman, aged 43 years, had suffered for twelve months from pains in the right shoulder, which, in six months, became laminating and excessively severe. About two months before admission into the hospital, under the care of Mr. Mitchell Henry, she first noticed a swelling, which at length produced such extreme suffering as to demand disarticulation, on the 10th of September, 1857. Much of the tumour, which was as large as an orange, was composed partly of dense osseous tissue, and partly of firm fibroid material, and was continuous with a soft, reddish substance which occupied the medullary cavity of the head of the humerus. The external parts of the growth were made up of fibroplastic tissue and a few myeloid cells, while the internal red portion was composed almost entirely of giant cells. When she was discharged at the end of five or six weeks, there was some suspicious tumefaction about the shoulder; and on her return, on the 16th of November, or in eleven weeks after the operation, her health was entirely broken down, and there was an ulcerated tumour of the stump, which increased, until it attained the size of a foetal head, and was the seat of excessive pain and a profuse, fetid discharge.

After death, on the 16th of December, dissection disclosed a mass growing from the neck of the scapula, and including the axillary glands, which, however "could not be made out distinctly," which was composed of calcified bosses, divided by fibrous septa and loose clots of blood, and of softer tissue. The latter was made up of small nuclei and oval and fusiform cells in a finely granular gelatinous matrix, and numerous giant elements were present in nearly every part of the tumour. In each lung were from twenty to thirty superficial nodules, which varied in size from a pin's head to a

<sup>1</sup> Virchow (op. cit., vol. ii. p. 321) states that he has never seen an osteoid metastatic tumour in a bone.

<sup>2</sup> Guy's Hosp. Reps., ser. 3, p. 174, and Trans. Path. Soc., Lond., vol. ix. p. 244.

<sup>3</sup> Trans. Path. Soc., Lond., vol. ix. p. 367.



pea, and were composed of calcifying small-celled tissue, in which giant cells were not abundant. The other viscera were normal as regards secondary deposits.

CASE IV.—Mr. J. Cooper Forster<sup>1</sup> has recorded the case of a boy of 18 years, in whom, on the 18th of May, 1857, Mr. Cock amputated through the thigh for a myeloid tumour of the head of the fibula, of about five months and a half standing. Masses of bone were interspersed through an encephaloid tissue, “but here and there were portions which presented cells of a true myeloid character,” or, as Dr. Wilks,<sup>2</sup> who describes the sequel, under the title of a “Case of Osteoid Cancer combined with Myeloid Disease,” states, the soft white material was composed of a “mass of nucleated cells; interspersed with these, however, were numerous polynucleated cells with branching processes, such as are styled myeloid.” At the end of August the patient had become paraplegic, and death ensued on the 16th of October. There was no return of the disease in the stump; and all the organs, excepting the lungs and spine, were healthy. Each of the former contained about twenty red, vascular nodules, of which the largest were of the size of a marble. They were composed of calcareous granules, and of cells similar to those found in the original tumour. The lower dorsal vertebræ were infiltrated with the same histological elements; their bodies were destroyed posteriorly, the theca of the cord was surrounded by the new material, and the medulla was disorganized.

CASE V.—Mr. Hutchinson<sup>3</sup> removed, on the 14th of May, 1856, the upper third of the humerus, along with the acromion and coracoid processes, and a mass of enlarged glands, of a woman 33 years of age, on account of a tumour of the size of an infant’s head, of four years and ten months’ duration, which contained deposits of soft spongy bone, and was composed of fibroplastic cells and many large polynucleated cells, the former of which predominated. In three weeks an enlarged gland was detected in the posterior triangle of the neck; in ten weeks the main wound had closed, but about this time a fungus appeared at the unhealed wound left by the removal of the infra-axillary glands, and the upper divided end of the humerus became tumid. The disease continued to progress in each of the three different situations; the cicatrices of the incisions gave way, a large fungus projected, and the woman finally died, about five months after the operation, from the effects of repeated hemorrhages from the lower fungus.

The recurrent growths of the axilla and of the periosteum of the shaft of the humerus, at the point of section, “exuded most plentifully a white cream-like juice, which abounded in free nuclei, and contained some large cells, having from one to three nuclei.” In the right lung were several deposits of infiltrated soft “cancer” resembling the growth in the axilla.

In all of these cases it is interesting to observe that the lungs were the seat of secondary tumours, so that, in this regard, the likeness between myeloid and peripheral sarcomas is complete. In four instances the bones, or their investing membrane, were also affected; but, with the exception of the dura mater, no other tissues or organs were involved.

<sup>1</sup> Trans. Path. Soc., Lond., vol. viii. p. 389.

<sup>2</sup> Ibid., vol. ix. p. 377.

<sup>3</sup> Ibid., vol. viii. p. 346.

These illustrations of the malignity of giant-celled sarcoma demonstrate conclusively that the idea of their absolutely innocent character must be abandoned. The explanation given by certain observers, as, for example, Nélaton,<sup>1</sup> Wilks,<sup>2</sup> and Forster,<sup>3</sup> that malignity is witnessed only in the "mixed" forms, is not tenable, since, as was demonstrated by Virchow,<sup>4</sup> giant cells are not the only elements found in these tumours, fusiform and round elements always being present in varying quantities, through which this variety of central sarcomas is, in reality, a "mixed" growth. Indeed, as Virchow states, the same objection might just as well be urged against the majority of cases which recovered after operation. Nor will it do, with Hutchinson,<sup>5</sup> to regard the original tumour as being of a myeloid nature, and the secondary deposits as cancerous, since at the time this case was recorded the nature of morbid growths was determined by the presence of so-called cancer cells in the juice, and not from properly prepared sections.

There is a point, however, in connection with the histological construction of these malignant giant-celled sarcomas, with which I have been particularly struck, namely, the presence of granules or masses of calcareous matter or of true bone in their interior, through which they have a close likeness to the periosteal osteoid or ossifying sarcomas, which are excessively malignant. In all of the foregoing instances, except Case II., these elements were found, and it is quite possible that bone was overlooked in that example, since the recurrent growths in the stump were surrounded by capsules which were in part osseous, although that tissue seems to have been absent from the secondary deposits in the lungs. In Case I., the mass was pervaded by numerous points of ossification, and its lower portion was occupied by a piece of bone, from which a column was extended, between the crucial ligaments, to the tibia. The metastatic nodules in the lungs contained calcareous points, and a piece of fully formed bone was found in the largest nodule. The tumour of the frontal bone was ossifying, and those of the dura mater were calcifying. In Case III., the primary tumour was partly composed of dense osseous tissue, while the recurrent growth of the scapula was made up of calcified bosses, and the nodules in the lungs were calcifying. In Case IV., masses of bone were interspersed through the tissue of the original growth, and the secondary deposits in the lungs and vertebræ were the seat of calcareous granules. Finally, in Case V., deposits of soft spongy bone existed in several parts of the original tumour; but the recurrent and secondary growths, the examination of which, however, was certainly not thorough, were free from calcareous or ossific changes.

<sup>1</sup> Op. cit., p. 332.

<sup>2</sup> Lectures on Pathological Anatomy, Edited by Moxon, p. 59.

<sup>3</sup> Loc. cit.

<sup>4</sup> Op. cit., p. 336.

<sup>5</sup> Loc. cit., p. 352.

When it is remembered that calcifying and ossifying periosteal sarcomas are almost as malignant as the periosteal sarcomas which are not characterized by these degenerations; and that the secondary deposits, which are also most frequent in the lungs, are also the seat of similar changes, not only is the analogy between malignant central and peripheral sarcomas very striking, but one is tempted to ask, "Is not generalization, in some cases at least, due to these metamorphoses?"

In the solution of this question, it is necessary to determine, in the first place, whether the osteoid myeloid sarcomas are really more malignant than those in which calcareous or ossific changes are not observed; and, secondly, whether the mineral salts may not act as the carriers or transporters of the infecting material.

1. Out of 51 cases, of which I have full histories, 3 died without operation, and 48 underwent amputation or excision.<sup>1</sup> Of the latter, 15 died from the effects of surgical interference, and 33 recovered, but of these 5, that is to say, the cases above recorded, terminated fatally from general dissemination of the disease, at periods which varied from three months to two years, the average being eight months. Excluding 11 cases, in none of which does the history extend beyond two months after the operation, and, using for the purposes of comparison only those which remained well for periods which extended over three months and upwards, we have 22 cases, of which 5, or 22.72 per cent., died with recurrence of the disease, and 17 recovered. For convenience of reference, all of the recoveries are appended in the subjoined table, the cases used in the above comparison terminating with that of Mr. Morris, or No. 17.

With regard now to the degree of malignity of the osteoid, that is to say, the calcifying and ossifying varieties of myeloid sarcoma, the descriptions state that these metamorphoses were present in 7 of the 22 recoveries from operation. Of these, as I have pointed out, the four cases of Stimson, Henry, Forster, and Hutchinson, subsequently succumbed from generalization, while in 3 the deposits did not exert any influence upon the duration of life, since in Larrey's case the patient was alive six years and a half after the operation, and the disease had existed ten years before amputation was resorted to; while in the case of Bristowe, the man died of pulmonary phthisis five years after disarticulation at the shoulder, and in the case of Paget, the woman survived amputation of the thigh for "many years." These cases are numbered 8, 12, and 13 in the table. Of the remaining 15 examples in which the texture of the tumour was free from the mineral salts, only one, that of Wilks, died, and in this case six or eight large metastatic tumours were discovered in the lungs.

<sup>1</sup> Ten additional cases were subjected to amputation; but as they were recorded immediately after operation, and I could not trace their further histories, they were only used in the study of the general pathology of giant-celled sarcomas.

Table of Recoveries after Operations for Giant-celled Sarcoma.

Case.	Sex.	Age.	Seat.	Duration.	Operation.	Later history.	Total duration of life from first notice of disease.	Operator and recorder.	Reference.
1	F.	18	Upper humerus	?	Disarticulation	No return in 2 yrs.	?	Brodie and Gray	Med. Chir. Trans., vol. xxxix. p. 127.
2	M.	25	Lower femur	18 mos.	Amp. thigh	" " 5 "	6 yrs. 8 mos.	" "	" " " " p. 129.
3	M.	36	"	6 yrs.	"	" " 5 "	16 years	" "	" " " " p. 131.
4	M.	19	Lower fibula	12 mos.	" leg	" " 4 "	5 years	Parker and Gray	" " " " p. 137.
5	F.	21	Lower femur	14 mos.	" thigh	" " 5½ "	6 yrs. 8 mos.	Velpeau and Nélaton	Op. cit., vol. xxx., and Gaz. des Hôp., 1863, p. 25.
6	F.	29	Upper tibia	12 mos.	" "	" " 4 "	5 years	Chassaignac and Nélaton	Op. cit., Obs. xxxv., and Gaz. des Hôp., 1863, p. 25.
7	M.	29	Lower femur	10 mos.	" "	" " 4 "	4 yrs. 10 mos.	Chassaignac and Nélaton	Op. cit., Obs. xxxvi., and Gaz. des Hôp., 1863, p. 25.
8	M.	37	Lower radius	10 yrs.	" forearm	" " 6½ "	16½ years	Larrey and Nélaton	Op. cit., Obs. xlii., and Gaz. des Hôp., 1863, p. 25.
9	M.	26	Lower femur	28 mos.	" thigh	" " 3 y. 5 m.	5 yrs. 9 mos.	Billroth	Chir. Klinik, Zurich; 1860-67, p. 569.
10	F.	40	Lower radius	?	" forearm	" " 6 yrs.	?	Langenbeck and Senfioleben	Langenbeck's Archiv, vol. i. p. 143
11	F.	30	Lower ulna	?	Resec. ½ ulna	" " 4 "	?	" "	" " " " "
12	M.	18	Upper ½ shaft humerus	6 mos.	Disarticulation	" " 5 "	5½ years	Simon and Bristowe	Trans. Path. Soc. Lond., vol. vii. p. 351, and vol. x. p. 247.
13	F.	24	Upper tibia	10 mos.	Amp. thigh	" " many y.	?	Paget	Lect. on Surg. Path., 3d ed., 1870, p. 547.
14	M.	25	Lower femur	2 yrs.	" "	" " 2 yrs.	4 years	Cock and Wilks	Guy's Hosp. Rep., 3d ser., vol. iii. p. 168, Case I.
15	F.	24	Upper tibia	6 mos.	" "	" " 15 "	15½ years	Bryant	Guy's Hosp. Rep., 3d ser., vol. xxii., p. 314.
16	F.	29	Lower ulna	10 mos.	Excision lower ½	" " 8 "	18 months	Lucas	British Med. Jour., April 28, 1877, p. 515.
17	F.	?	Lower radius	10 mos.	" both bones	" " 10 "	20 months	Morris	" " " " " "
18	M.	18	Lower femur	4 mos.	Amp. thigh	" " 2 mos.	6 months	Hill and Godlee	Trans. Path. Soc. Lond., vol. xxv. p. 202.
19	F.	30	Upper tibia	18 mos.	" "	" " 40 days	19½ months	Lawrence and Gray	Med. Chir. Trans., vol. xvii. p. 155, and vol. xxxix. p. 133.
20	M.	43	Lower femur	18 mos.	" "	" " 1 mo.	19 months	Forquesson and Hulke	Archives of Medicine, vol. i. p. 110.
21	F.	33	"	12 mos.	" "	" " 7 wks.	14 months	Cock and Wilks	Guy's Hosp. Rep., ser. 3, vol. iii., p. 169.
22	M.	31	Upper tibia	15 mos.	" "	Recovered	16 months(?)	Marshall and Beck	Trans. Path. Soc. Lond., vol. xlii., p. 210.
23	M.	20	Lower tibia	12½ mos.	" "	Recovered	13½ months(?)	Hilton and Moseley	" " " " vol. xx. p. 279.
24	F.	22	Upper ulna	6 yrs.	Resection elbow joint	No return in 2 mos.	6 yrs. 2 mos.	Langenbeck	Langenbeck's Archiv, vol. xxi., supp. p. 329.
25	F.	26	Upper fibula	15 mos.	Excision ½ fibula	" " 8 wks.	17 mos.	"	Langenbeck's Archiv, vol. xxi., supp. p. 333.
26	M.	37	"	12 mos.	Amp. thigh	Recovered	13 months (?)	Bennett	Dub. Jour. Med. Sci., Sept. 1, 1877, p. 247.
27	M.	27	Lower femur	2 yrs.	" "	Recovered	2 yrs. 1 mo. (?)	Little	Trans. Path. Soc. Lond., vol. xiv. p. 245.
28	M.	16	Upper tibia	2 yrs. 9 mos.	" "	Recovered	2 yrs. 10 mos.	Butlin and Savory	St. Bartholomew's Hosp. Rep., vol. x. p. 120.

From the foregoing considerations it will be seen that 22.72 per cent. of all cases of myeloid tumours are malignant, and that the degree of malignity may be graded in accordance with the existence or absence of calcareous or osseous deposits, since these were found in the original tumour in four of the five cases of metastasis. Further, it will be observed that the osteoid myeloid tumours are not absolutely malignant, as 42.85 per cent., or 3 out of 7, patients remained well several years after their removal. Finally, in this connection, it may be stated that of 15 examples of giant-celled sarcoma, in which calcification or ossification is not noted, only one was characterized by secondary growths. Hence the prognosis of the latter is as favourable as is the prognosis of some other neoplasms which are considered to be of an innocent nature.

2. How far the mineral salts present in the primary tumour may behave as transporters of the infecting material which gives rise to the secondary growths in the lungs and elsewhere is, of course, open to criticism. That they are active agents in the general dissemination of the disease would not seem improbable from a consideration of the foregoing statements, from which it may be observed that metastatic tumours were discovered in 57.14 per cent. of all instances of calcifying or ossifying myeloid sarcomas, while they were present in only 6.66 per cent. of simple giant-celled sarcomas. The calcareous metastasis itself is due to the absorption of the salts of the imperfect bone of the primary growth, which are set free by a process precisely similar to that which I have already described under the head of the mode of development of these tumours. Saturated, as these salts must be, with the juice or fluid constituents of the original growth, it is not difficult to conceive that they act as the seed of infection of the cells of the parenchyma of the organs to which they are carried, and thereby give rise to secondary nodules, which present the same histological peculiarities as the mother tissue. Be this as it may, however, the fact remains that the calcifying and ossifying sarcomas, whether central or periosteal in origin, are, with the exception of the pure periosteal spindle-celled, and round-celled, the most malignant of all the neoplasms of the long bones.

The duration of life of the subjects of giant-celled sarcoma of the long bones is very variable. In a few instances death has occurred in three, four, five, and six months, while in others it has been postponed for many years, and recoveries are recorded ten and even fifteen years after operation. Unfortunately the cases which pursued a natural course are too few to be of any value in estimating the average duration of life, and in determining whether or not life is prolonged by surgical interference. Of 51 cases, of nearly all of which I have complete histories, only 3 ran a natural course. Of these, 1, that of Dr. Brown,<sup>1</sup> died of general erysipelas, ten years after the first appearance of the disease; in one reported

<sup>1</sup> Ante.

by Peulevé,<sup>1</sup> the patient died of debility at the end of nine months and a half; while the third, which occurred in the practice of Carville,<sup>2</sup> terminated fatally from broncho-pneumonia in nine months.

Accurate statements of the duration of the disease up to the date of operation and of the prolongation of life after operation are given in 44 of the remaining 48 cases,<sup>3</sup> from which it appears that the duration of life varied from three months to sixteen years and a half, the average having been 40.9 months, the majority of the patients being still alive at the date of the reports. 33 patients<sup>4</sup> remained well for periods which ranged from a few weeks to fifteen years after the operation,<sup>5</sup> while 15 died from the effects of surgical interference. Hence the average duration of life from the first observation of the disease among the 28 subjects<sup>6</sup> who survived resection or amputation was 54.8 months, or rather more than four years and a half.

Among the recoveries, that recorded by Bristowe deserves particular notice, as secondary deposits in the lungs might naturally have been anticipated from the condition of the neighbouring bloodvessels. After amputation at the shoulder, on account of a myeloid sarcoma of the head of the humerus, the anterior flap was seen to contain numerous veins, of the size of a goose-quill, which passed from the tumour into the substance of the deltoid muscle, and were filled with soft, pulpy growths, which were composed of giant cells. After the operation a considerable portion of the flap sloughed, and it was thought highly probable that the slough included all the diseased veins. On death from phthisis, five years subsequently, there were no evidences of metastatic deposits.

As I have already pointed out, recovery after operation is liable to be permanent, since of the 22 patients previously alluded to who underwent surgical treatment, 17 remained well for periods which ranged from eight months to fifteen years, the average being 58.7 months; while in 5 in which general infection occurred, the average duration of life after operation was 8 $\frac{3}{5}$  months. In all of the latter the lungs were affected secondarily, and, in 4, there was also recurrence locally, these phenomena appearing on an average, at rather more than six months after surgical interference.

<sup>1</sup> Bull. Soc. Anat. Ser. 2, vol. x. p. 658.

<sup>2</sup> Ibid., ser. 2, vol. xii. p. 475.

<sup>3</sup> Cases 1, 10, 11, and 13 of the table are omitted, as definite information on one or the other of these points is wanting.

<sup>4</sup> This number includes the 28 cases of the table, and the 5 instances of recurrence of the disease after recovery from operations.

<sup>5</sup> In the table, where "recovered" alone is mentioned under the head of "later history," I have assumed that the patient was well four weeks after surgical treatment.

<sup>6</sup> The cases of generalization are included in this computation, and cases 1, 10, 11, and 13 of the table are excluded; but it is interesting to note that the patients were alive, respectively, 2, 6, 4, and "many years" after surgical interference.

The previous duration of the disease appears to exert an influence upon local and general recurrence, since in the cases of permanent cure the tumour had existed, on an average, 25 months before operation, while in the cases of recurrence, the average duration before operation was 16½ months. In the latter cases, also, the tumour had acquired a large volume in a short space of time, so that the general rule may be established that a rapidly growing myeloid sarcoma is more liable to prove malignant than one which runs a slow course.

While it is doubtless true, as Virchow declares,<sup>1</sup> that in myeloid, as in the other varieties of sarcoma, there is a period during which the tumour remains innocent, and is amenable to surgical treatment, and that early and effectual removal is the only measure to guard against recurrence, general pathology fails to indicate what that period is. Indeed, it may be accepted as an axiom that early operations are not more successful in prolonging life than those practised at a late date. In the cases of recurrence, for example, the disease had existed, respectively, two, five, seven, ten, and fifty-eight months; four, therefore, having been subjected to operation within a year from the first observation of the growth, and yet local and general infection and death ensued just as rapidly in the cases of five and ten months' duration, as in the case of fifty-eight months of existence. So, too, an inspection of the table of recoveries demonstrates that the best results are obtained when operations had been practised at comparatively late periods. Hence the prognosis rests less upon the time of operation after the first appearance of the disease, than upon the histological construction of the tumour. If, after removal, the latter is found to be free from calcareous and osseous degeneration, it may safely be assumed that the disease will not return, whereas if those transformations are present, the chances are against the patient.

Giant-celled sarcomas give rise to symptoms which, while they vary according to the size and consistence of the tumour, are, unfortunately, not distinctive. Hence their diagnosis is often exceedingly difficult and embarrassing.

In 50 per cent. of all cases the disease is ushered in by pain, which is usually of a dull aching character, but is occasionally lancinating and very severe, and is succeeded by a firm, immovable swelling in the vicinity of a joint. In 31 per cent. of all cases pain and tumefaction are observed simultaneously; while in 19 per cent. the affection begins insidiously, swelling alone being the first sign noticed by the patient.

Having once formed, the tumour grows, as a rule, slowly and continuously; is free from pain and tenderness; the temperature is not elevated, the overlying skin is normal in texture, colour, and mobility; and the subcutaneous veins and lymphatic glands are not enlarged.

<sup>1</sup> Op. cit., p. 340.

To these general statements the following exceptions must be noted: in 29 per cent. of all cases the tumour increases rapidly, while in 6 per cent. its growth is temporarily arrested; in 40 per cent. the pain perseveres throughout the entire course of the affection, being commonly moderate, rarely continuous, and only severe and harassing in about one-third of the cases, when it generally depends upon implication of the corresponding articulation; in 14 per cent. the neoplasm is tender to the touch, but, as a rule, only slightly so; the temperature is elevated in 6 per cent.; the skin is altered in 33 per cent., the most common changes being discoloration and tenuity, ulceration being a curiosity; the lymphatic glands are the seat of tumefaction, from irritation, in 16 per cent.; while, finally, the subcutaneous veins are much enlarged in 27 per cent. of all cases.

The tumour itself has a spherical or ovoid form, and its surface is generally smooth and regular, although it may be bosselated or lobed. If its constituent elements have not undergone retrograde metamorphoses, and if its investing capsule be merely membranous, its consistence is firm, tense, and elastic; but, in the event of cystic, hemorrhagic, or advanced fatty changes, it is soft, and apparently fluctuating. Should the capsule be partly periosteal and partly bony, as usually happens, it will feel hard, and perhaps crackle, at some points, and elastic, or soft, or fluctuating at others; while, if it be completely osseous, as occurs in about 16 per cent. of all cases, it will be densely hard, although when the shell of bone is thin, parchment-like crepitation is elicited, or fracture even occurs under manipulation. On exploratory puncture blood nearly always issues, and sometimes freely, especially if the growth be very vascular or pulsates. In other instances, the fluid of softening cysts escapes from the artificial opening. In rare cases pus may even appear, as in two examples the tumour was found to be suppurating.

Pulsation when present, as it was in 20 per cent. of all the cases of which I have complete histories, is a most valuable sign, since it has not been observed in other neoplasms, whether central or peripheral, of the long bones, excepting six examples of the other varieties of central sarcoma, five of which occupied the shafts, and one the epiphysis, and in one case of osteoid sarcoma surrounding the lower end of the femur. Allusion is, of course, made to pulsation resident in the growth itself, and not to pulsation transmitted to it from contiguous arteries. It has not, curiously enough, been met with in myeloid tumours of the bones of the upper extremity; but has been recorded four times in giant-celled sarcoma of the head of the tibia,<sup>1</sup> four times in the condyles of the femur,<sup>2</sup> and in the upper and lower epiphysis of the fibula, respectively, once.<sup>3</sup>

Finally, a large, immovable, spherical, slowly-growing, probably pain-

<sup>1</sup> Cases of Labbé, Chassaignac, Sirius-Pirondi, and Lücke.

<sup>2</sup> Cases of Billroth, Godlee, Carville, and Robin.

<sup>3</sup> Cases of Langston Parker, and Langenbeck.



ful, and possibly pulsating tumour, of varying degrees of consistence, occurring in the articular extremity of a long bone, between the fifteenth and fortieth years, or at about the twenty-eighth year, unattended by changes in the integuments, or by enlargement of the subcutaneous veins and lymphatic glands, and not marked by impairment of the general health, may be pronounced to be a giant-celled sarcoma.

In the treatment of this class of tumours, general measures being worthless, no time should be lost in resorting to amputation or excision. Although surgical interference has been followed by a mortality of 31.25 per cent. there can be no reasonable doubt that it has frequently succeeded in preventing local and systemic infection, as well as prolonging life. The more rapid the growth of the tumour, the more reason there is for early operation. Indeed, in view of the difficulty in determining the true nature of the neoplasm in its incipient stages, delays are extremely dangerous, since, instead of having to deal with a pure myeloid sarcoma, the disease may eventually prove to be an osteoid sarcoma, or a small-celled medullary sarcoma, in which events, valuable time will have been lost, and the patients have been exposed to the dangers of local infection and general dissemination.

In selecting an operation the golden rule should be observed to go as far as possible from the seat of disease, without needlessly jeopardizing life. The reasons for this line of conduct will be perfectly clear, if it be remembered that the overlying soft parts, the contiguous bones, and even the joints, may be involved by extension of the disease. Hence it is that when operations have been practised next the trunk, or in close proximity to the tumours, the prognosis is bad, as, in the event of recurrence, nothing more can be done. In the cases of Henry<sup>1</sup> and Hutchinson,<sup>2</sup> for example, in which, respectively, disarticulation at the shoulder, and excision of one-third of the humerus had been practised for myeloid tumours of that bone, there was recurrence in the stump, and in the lungs. So, too, in a case in which Langenbeck<sup>3</sup> resected eight inches of the humerus for a tumour, as large as the double fist, which had perforated its capsule and extended processes between the muscular fibres of the flap. On death from exhaustion, ten weeks subsequently, the muscles of the supra and infrapinnous fossæ of the scapula were found to be the seat of sarcomatous tubers. In all of these cases, diseased tissue had escaped the action of the knife, and precisely the same thing may happen if a limb be removed in its continuity too close to the morbid growth.

From these considerations I would establish the following general rules for guidance in selecting the point at which amputation should be performed :—

<sup>1</sup> Trans. Path. Soc., Lond., vol. ix. p. 367.

<sup>2</sup> Ibid., vol. viii. p. 351.

<sup>3</sup> Langenbeck's Archiv, vol. i. p. 142, case v., and Gurli's Jahresbericht für 1860-61, p. 532.

For tumours of the lower epiphyses of the tibia and fibula, just below the knee; when the upper epiphyses of these bones are affected, through the lower third of the thigh; at the junction of the upper and middle thirds of the thigh for disease of the condyles; at the hip-joint for that of the upper extremity of the femur; below the elbow for tumours of the lower epiphyses of the radius and ulna; through the lower third of the arm when the upper epiphysis of the ulna is affected; at the junction of the upper and middle thirds of the arm for disease of the condyles of the humerus; and at the shoulder joint when the head of the humerus is involved.

In the event of the neoplasm being small, for example, not larger than an orange, it will not be necessary to go so high up. For a tumour of that size occupying the lower end of the tibia or fibula, the leg may, with great propriety, be amputated through its middle. On the other hand, a voluminous tumour may require the incisions to be made farther off. Thus, a growth, as large as the head, commencing in the lower extremity of the radius, had best be removed by disarticulation at the elbow.

Instead of amputation, excision of an entire joint, or of the affected epiphysis, along with the shaft, of the more slender long bones may be resorted to, particularly if the tumour presents a uniformly smooth surface, and is of a firm, dense consistence, or is inclosed in an osseous shell. Under these circumstances the surrounding tissues will, most probably, be found to be free from involvement; whereas, if the morbid growth is bosselated, and soft and elastic, or apparently fluctuating, the neighbouring structures will be likely to be implicated, and amputation should be selected. In cases of doubt, excision may be commenced, and removal of the limb be substituted for it, if the capsule of the tumour is discovered to be perforated, and the soft parts infiltrated by the morbid product. If the periosteum of the adjacent bone is firmly adherent to the capsule of the neoplasm, or if the bone is eroded, the latter should also be excised, since, in these conditions, it is liable to be the seat of sarcomatous deposits.

These general statements are illustrated by the following abstracts of all the cases that I have collected of excision of myeloid sarcomas. The subjects in all, except the eighth case, were females, and in four the tumours were voluminous:—

CASE I.<sup>1</sup>—Langenbeck excised, antiseptically, seven inches of the ulna, four inches of the humerus, and the head of the radius, on account of a tumour, as large as a man's head, of the upper extremity of the ulna. The end of the humerus was deprived of its cartilage, and its spongy tissue exposed. In the latter was embedded an isolated, soft, dark-red nodule, of the size of a cherry, which was made up of giant, spindle, and round cells. Forty catgut ligatures were required to arrest the hemorrhage. The woman was well two years subsequently, but the arm was of little use.

<sup>1</sup> Case 24 of table.

CASE II.<sup>1</sup>—From a female, aged 26 years, Langenbeck removed, antiseptically, nearly four inches of the lower end of the ulna, for a tumour in that situation, of three months' standing, and as large as the fist. High febrile excitement set in, the joint suppurated, and was itself excised on the seventh day. Death, however, ensued under pyæmic symptoms.

CASE III.—<sup>2</sup>Langenbeck excised three-fourths of the ulna for a tumour, inclosed in a perfect bony capsule, which began in the lower end of that bone. The woman was in perfect health at the expiration of four years.

CASE IV.—<sup>3</sup>Mr. Lucas removed the lower half of the ulna for a growth which extended two inches and a half above the wrist-joint, the latter of which was left intact, as it was protected by the triangular articular fibro-cartilage. Eight months subsequently the woman had free use of her hand, employing it in all her household work, the movements of pronation and supination being perfect.

CASE V.—<sup>4</sup>For a tumour of the lower end of the radius, Mr. Morris excised about four inches of both the radius and ulna, the latter of which was closely attached to the osseous capsule of the growth. The woman was alive eight months afterwards, but the limb had to be supported by a splint, and was practically useless.

CASE VI.—<sup>5</sup>Langenbeck excised, antiseptically, one-half of the fibula, along with a myeloid sarcoma, as large as a child's head, which started in its upper epiphysis. Forty catgut ligatures were applied to the divided vessels, and the woman was well eight months subsequently.

CASES VII. and VIII. are those of Langenbeck and Hutchinson, previously alluded to, in which the upper extremity of the humerus was the seat of the disease. In the former, eight inches of the bone were resected, but death occurred in two months from exhaustion due to profuse suppuration. In the latter, one-third of the bone was excised, along with the acromion and coracoid processes, which, however, were not implicated. The arm was bidding fair to be useful, but death occurred in five months from local and general recurrence.

CASE IX.—<sup>6</sup>In consequence of amputation having been declined, Billroth excised six inches of the lower extremity of the femur. The patient, a girl, 17 years old, died of pyæmia on the twenty-sixth day.

From an operative standpoint, little can be said in favor of excision, except when the lower end of the ulna is involved in a small tumour, and the interarticular cartilage can be preserved, through which the wrist-joint remains unopened. In a case of this description, Mr. Lucas succeeded in giving his patient a useful limb, while in the remaining recoveries the limbs were simply incumbrances. Besides, the mortality after excisions is greater by 3 per cent. than after amputation, notwithstanding the fact that the former was practised on the bones of the upper extremity, except in two instances, while the thigh was the seat of the majority of the amputations.

<sup>1</sup> Langenbeck's Archiv, vol. xxi. supp. p. 331.

<sup>2</sup> Case 11 of table.

<sup>3</sup> Case 17 of table.

<sup>6</sup> Billroth, Chir. Klinik, Wien., 1869-70, p. 367.

<sup>2</sup> Case 16 of table.

<sup>4</sup> Case 25 of table.

Whatever operation be selected, if it be conducted near the seat of the disease, the surgeon should be prepared to encounter considerable hemorrhage. Thus in cases I. and VI. of the excisions, not less than forty ligatures were required, while in the case of Professor Gross (see p. 41) of disarticulation at the shoulder, the loss of blood was so great, despite compression of the subclavian artery, that death ensued in two hours.

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## ARTICLE II.

THE SUDDEN DEAFNESS OF SYPHILIS, WITH CASES. BY SAMUEL SEXTON, M.D., Surgeon to the New York Ear Dispensary, Aural Surgeon to the New York Eye and Ear Infirmary.

WRITERS on aural affections have long known that invasions of the ear by syphilis were not of uncommon occurrence, and the prevailing opinion has been that the seat of the lesion is usually in the labyrinth. Better knowledge of the disease, however, seems to lead to the conclusion that its chief, if not entire, location is in the middle ear and its conductive mechanism. At the beginning of this century, especially in England and France, there was a sudden increase in otological literature,<sup>1</sup> if it deserves that name, and the references to "constitutional deafness," which included aural affections, having their origin in syphilis, are frequent.

Mr. Saunders,<sup>2</sup> whose work in 1806 fairly represented the then existing views on this subject, says (page 95, *et seq.*), "The whole class of the diseases to which the internal part of the ear is subject may be denominated nervous deafness," and after describing the distressing and peculiar tinnitus which characterizes "nervous deafness," he goes on to say, "Being forcibly struck with the congruity between deafness produced by syphilis, and the concomitant symptoms of nervous deafness, I could not avoid concluding, that although the remote cause be different, the proximate cause is the same in each," and "When the syphilis is cured, the effect is often irremovable, and the injury to the function of the affected organ permanent. There is a period, therefore, at which syphilitic deafness is irremediable, and this is more remarkably the case with nervous deafness." Saunders having satisfied himself that the proximate cause of syphilis and nervous deafness was the same, determined to try the success of an analogous treatment in a recent case of "nervous deafness." The patient selected was J. Waiton, who applied to Mr. Saunders at the Dispensary for

<sup>1</sup> Vide Works of Saunders, London, 1806; Curtis, London, 1819; Wright, London, 1829; Caswell, London, 1833, and Itard, Paris, 1821; Deleau, Paris, 1822; Saissy, Paris, 1827, etc. etc.

<sup>2</sup> Treatise on the Ear, first American edition, Phila. 1821.

relief. "He had been extremely deaf for two months. The meatus contained little wax, and he could inflate the tympanum. He complained of noises in the head, such as I have described above. His deafness was so great that I could scarcely make him hear what I said. He was a robust man, and plethoric. I put him on a most rigid diet, and gave active cathartics three times a week. For the first fortnight the doses were calomel gr. viii at night, and natron vitriolat. ʒiiss in the morning. Blisters were also applied behind the ears three times successively at intervals of a week. He continued on this plan for six weeks, the cathartics being regulated according to circumstances. His hearing was now restored, but slight noises still remained. He was much reduced, and I gave him small doses of calomel every night, and sarsaparilla twice a day for a fortnight. The noises had now left him, he was put on his usual diet, and took cinchona. At the end of ten weeks he was perfectly well."

Mr. Saunders reports other cases in which in his own hands the above treatment was successful, but he fails to inform the reader if any of them had syphilis, an unimportant fact surely with the accepted nomenclature of that day. Mr. Saunders regarded the immediate cause of the deafness to be the deposition of lymph, and in the incipient state he proposed to attack the disease by a "strict antiphlogistic treatment," and the resort to means for promoting absorption. This was the period which immediately preceded the day of Joseph Toynbee, when the foundation was laid for a more exact pathology.

The English aurists<sup>1</sup> of the period subsequent to those above mentioned almost entirely omitted syphilitic affections of the ear from their writings, as did also the continental writers, unless, indeed, an exception be made of the researches of Frank and Linke, who, however, confined themselves mostly to the description of external syphilitic lesions.

It remained for Sir William Wilde to more nearly approach a solution of the syphilitic affections of the tympanum which this paper is intended to describe than had any one else previously. Although Wilde treats of the subject under the head of *syphilitic myringitis*, he evidently describes the disease as it affected the tympanum and its conductive mechanism. He says :—<sup>2</sup>

"Although practitioners who treat syphilitic diseases upon a large scale appear to be aware of the fact that venereal occasionally causes deafness, I cannot find any authority which has noticed the disease I am about to describe. The deafness which sometimes accompanies the secondary form of syphilis is generally believed to be caused by inflammation, and ulceration extending from the throat through the Eustachian trumpet into the middle ear; such may, under certain circumstances, no doubt, occur, and produce destructive inflammation and suppuration in this cavity, although I have never seen such a case myself, nor have I met with a well authenticated instance of it recorded. . . . The disease which I am

<sup>1</sup> Pilcher, Dufton, Harvey, Toynbee, Yearsley, etc.

<sup>2</sup> Practical Observations on Aural Surgery, by William R. Wilde, Phila. 1853, pp. 252, et seq.

about to describe is an inflammation of a specific character, occurring in the membranes of the tympanal cavity, but chiefly exhibited in the external membrane of the drum. All the cases I have seen of this affection occurred in young men, and generally those of fair complexions and blue eyes, who had had primary sores upon the genitals from six to twelve months previously, which sores were of rather a deceptive character, so that mercury was seldom given in the first instances, at least in a legitimate form."

In these cases there were generally well marked secondary affections, and—

"In almost every case which I have witnessed, the *disease appeared suddenly*, as an eruption was fading off; in two, it came on at a later period, and was accompanied by a loss of hair; in most it appeared in the upper or middle ranks of life. In most cases there is at first a sensation of fulness in the head, and often vertigo upon stooping or rising up suddenly, and the patients have usually a feeling of fulness within the ear; but in no instance have I seen it accompanied by acute pain, in which circumstances it resembles the subacute form of inflammation already described, and is therefore placed as a subdivision of that species; but upon inspection, the amount of redness and vascularity will be found very much greater than the latter; . . . both ears are usually attacked at the same time."

"The amount of deafness is always very great, and is the symptom that first attracts the patient's attention, and it seldom varies. Tinnitus is not usually present, but in two cases which I possess the notes of, the deafness was ushered in by a very loud noise, which passes away after a few days. *This inflammation does not end in a muco-purulent discharge from the tympanum, the surface of the membrana tympani, or the sides of the auditory canal.*" . . . Two of the worst cases of non-congenital deafness I ever saw appeared to have been the result of syphilitic inflammation, and in both there was great thickening, opacity, and insensibility of the membrane. I am also inclined to think that syphilis has played a more extensive part in the production of deafness than the profession is aware of."

It will be observed that Wilde regarded the disease as an affection of the membrana tympani only, but his description comes very near reaching the disease as it is now believed to exist in the middle ear. That he did not find tinnitus in all of his cases may be accounted for by supposing that in some instances an error in diagnosis was made. Wilde reports several cases that were cured with mercury pushed to salivation.

Writers, since the time of Wilde, have not added much to his pathology of this subject; the majority of them, in fact, have sought for an explanation of some of the prominent symptoms of the disease by locating the lesions in the labyrinth. Schwartz<sup>2</sup>, who has written exhaustively on aural pathology, omits any account of special syphilitic lesions, although he includes in his work croupous and diphtheritic inflammations. Schwartz's researches, however, throw us into a state of doubt as to our knowledge of the pathological physiology of the labyrinth when he informs us that so little is known regarding its pathological histology. He says:—<sup>3</sup>

<sup>1</sup> The italics are ours.

<sup>2</sup> The Pathological Anatomy of the Ear. Schwartz. Translated by J. Orne Green. Boston, 1878.

<sup>3</sup> Loc. cit.

"The pathological histology of the labyrinth of the ear is still in the first stages of its development, and needs the services of an extraordinary anatomist, who must work deeply and thoroughly in this most difficult field for years to bring forth any result. What has been done by some in this field, of late years, with the most earnest endeavors, is scarcely more than a sad dillitanteism, and has no value for science."

A step forward has certainly been taken in removing from the list of nervous affections of the labyrinth diseases whose symptoms now clearly establish their identity with anomalies of the conductive apparatus of the middle ear. Of the primary and secondary diseases of the acoustic nerve, or of the labyrinth and its bony case, we know but little, and can, therefore, place but little value on observations made with the belief that such knowledge exists. "Even in the most acute inflammations of the tympanum, a simultaneous hyperæmia of the labyrinth is met with only exceptionally," "and the existence of an independent and primary non-traumatic inflammation of the membranous labyrinth has not yet been demonstrated anatomically with certainty." And it may be added that the temporal bone is not regarded as a favorite seat of such syphilitic affections as exostosis and the like.

The attacks of syphilis described by Wilde have many symptoms which also characterize sub-acute (non-purulent) mucous catarrhal inflammation of the middle ear, and I believe the specific character is frequently engrafted upon the catarrh. The ordinary catarrhal inflammation, however, is never attended by pathological conditions of the middle ear, causing the sudden and absolute deafness which attends on syphilis. The frequency of this affection is, I am sure, much greater than generally supposed, the greater number of such cases having been, in my own former experience, placed under the head of labyrinthian diseases.<sup>2</sup> When we consider that scarcely any part of the body escapes the ravages of syphilis, it is no matter of surprise that the ear is frequently invaded; in fact, an ear highly hyperæmic from any cause would seem to invite the disease to a region extensively supplied with a mucous membrane, and not without connective tissue, both of which structures are obnoxious to syphilis. The middle ear is probably but seldom invaded by syphilis *per* the Eustachian tube by extension from the mouth, throat, etc., the attack more frequently having its origin in the ear itself. The following cases are selected from my notebooks as examples of this disease.

CASE I.—A German, aged 42, salesman, first seen by me December 29, 1877. On May 8, 1877, he became an inmate of St. Francis Hospital, from the records of which I learn that he gave a history of syphilis extending back two years before his admission. He had long been intem-

<sup>1</sup> Loc. cit., page 157.

<sup>2</sup> Nottingham relates a case, but is unable to decide whether the disease should be located in the middle ear or in the labyrinth. In this case a mercurial course, and another of iodide of potassium, did no good. Diseases of the Ear. Nottingham. London, 1858.

perate, and was much run down. Three months before his admission, he was weak and dizzy and staggering from side to side when walking, and he suffered from occipital headache, which gradually extended over the whole head. He had Bell's paralysis on left side of face. On admission the pain in head was intense, the paralysis of face still existed, and he was very anæmic and feverish. The prominent symptom now observed was hemicrania, first in left side of head, later in right side; finally both sides were the seat of intense suffering. Potassium iodide was given him in doses as high as 80 grains daily, with no relief. Bromide of potassium was substituted and afforded some relief. The paralysis now existed on both sides.

*August 1.* Headache has been a little relieved, but deafness became a feature in both ears, and afterwards tinnitus, "like the wind in motion," was experienced, it being greatest in the left ear. No loss of sensibility or muscular contraction; soft palate drawn to left side; motor paralysis of right side of face diminished. Cannot hear shouting.

*September 5.* Discharged. During the last two months of his stay, he took biniodide of mercury and iodide of potassium. A brain tumour was supposed to be the cause of these symptoms. He now came to the New York Ear Dispensary (December 29, 1877), and an examination showed the right membrane to be very dull, somewhat congested at the anterior superior quadrant, and along the malleus plexus. It was greatly retracted. The left membrane was similar to the right, but there was a faint cone of light.

A vibrating tuning fork placed on teeth heard best in right ear; on vertex and glabella not heard. It is heard when held near either ear, and when on left mastoid. Vision at no time affected. His appetite is now good, but he has a dull, heavy look, and cannot close the left eye. He speaks as though his mouth was full of some fluid—the uvula drawn to right side. Eustachian tubes are open. His general health is fair, although there is yet much unsteadiness in his gait, for which he requires the use of a cane. When standing with closed eyes he feels "trembly," and if he attempts to walk he staggers, and has to exert himself to keep from falling. He was placed on biniodide of mercury  $\frac{1}{2}$  gr. three times per diem.

*January 9, 1878.* Much better; walks without cane. When trying valsalva, cannot keep lips closed without holding them with his fingers. Perforated right membrane to-day in its anterior segment; no fluid in drum; but air passed readily on valsalva. There was no change in the hearing. Treatment continued.

*February 3.* Is getting stronger daily, and has less tinnitus. Fancies he can distinguish very loud noises slightly. Walks much better, and has been engaged at work as a street vender. Vision good. To cease treatment.

*18th.* Sounds like a drum or a church bell faintly heard. Finds cane only necessary at night. Cannot close his eyelids. There exists no pain. The membrane is clearing, although the anterior superior quadrant is somewhat thickened and injected. The right membrane resembles the left. His hearing for voice is not improved; indeed, he cannot hear any voice, however loud. The patient came no more.

CASE II.—A laborer, aged 21, was first seen by me January 11, 1878. Six months ago had a sore on penis, shortly followed by an eruption on the chest, and then on the legs. In five months after the sore appeared he awoke one morning and discovered that he was very deaf, and in a few



days he could hear nothing. Having been exposed at out-door labour, he believed the deafness to be due to "cold." Three days later he experienced great pain in the occiput, extending down the neck, which was swollen, and so remained three weeks, during which time he was dizzy and unable to walk straight. There was dimness of vision. Simultaneously with the pain referred to, he experienced tinnitus in both ears which was like machinery in motion, sounding bells, etc. The tinnitus now is "like the wind."

Both *meatus*, which were large, contained a thin tenacious coating, which was dark in colour from the presence of dirt and cerumen, and remained attached to the integument of the meatus after syringing. The tympanic membranes were not well seen on account of the presence of this closely adherent substance on their external surface. The right membrane was dull, lustreless, of a pale white colour, and moderately retracted. The left membrane has a similar appearance, but is greatly retracted, and the irregular depressions create a suspicion that adhesions or agglutinations threaten.

Words shouted through a trumpet into left ear are unheard, but he fancies he can hear some sounds when the experiment is made in the right ear. A vibrating tuning-fork is heard when placed in the cranial bones. He has some slight throat trouble, and the Eustachian tubes are open. Rarefaction of air in both *meatus* enables him to hear some few words through a speaking tube. He was put upon an active, mercurial course.

16th. Has a severe cough, and pain in the forehead, and when walking he is dizzy and staggers like a drunken man. If the eyes are closed, the staggering from side to side is greater, and the experiment increases the headache and dizziness.

19th. The left membrane is less retracted, and compression of air in the meatus improved the hearing on that side so much that he could hear a sentence loudly spoken through trumpet.

30th. Dizziness continues to exist, also the frontal headache, which sometimes extends to one side of the head. There is much tinnitus in the left ear.

Feb. 2. Patient seems to be improving, and there is less tinnitus. The membranes are gently moved inward and outward by condensation and rarefaction of the air in the meatus. Medicine is still continued.

9th. There is scarcely any tinnitus in the right ear, and in the left ear it is greatly lessened. He hears the vibrations of a small bell which is damped by being held in the hand while it is ringing, twenty inches from right ear and one inch from the left. His general health is improving, although he has some sweating at nights. The doses of the medicine are lessened one-third.

13th. The left membrane is retracted at the anterior superior quadrant, and lies so closely to the posterior wall of the tympanum that the point of adhesion resembles a perforation. The tough substance in both ears has been softened by dropping in water containing twenty per cent. of glycerine, and syringing to-day removed the most of it. It has but little resemblance to cerumen. The right membrane can be seen to be clearing up, the left is very dull, especially the anterior segment. His hearing is a little better.

23d. The posterior segment of the left membrane is adherent, and the short process protrudes prominently, but the handle is not well outlined. Rarefaction by syringe does not remove the membrane from its position

on the posterior tympanic wall, even when force sufficient to occasion slight bleeding is used. The whole membrane is gradually becoming adherent, but no active inflammation is apparent.

*March 2.* The right membrane is still clearing, and the left has become less adherent since last operation. There is free admission of air to both drums, which the patient is requested to renew by the occasional practice of Valsalva's experiment. There is less tinnitus and better hearing for bells, etc., in right ear.

*9th.* Left membrane is very irregularly retracted, and at anterior superior quadrant there is a hyperæmic condition. Patient now experiences very little dizziness. In both ears he has tinnitus.

*23d.* The right membrane is clear anteriorly, but about short process and extending down malleus handle there is a more less hyperæmic condition. In the left ear there is less tinnitus and better hearing.

*April 20.* Right membrane but slightly retracted and almost clear, except a small portion of the posterior segment, and there is a distinct cone of light. The left membrane is clearing also, but it is much sunken in places. He hears tuning-fork as before, and the Eustachian tubes are free. His hearing altogether is about the same that it has been for some time, *i. e.*, he cannot hear any words distinctly, however loudly shouted through a trumpet. There is no injurious effect of mercury observable. Patient did not again return. The temporary increase of the acuity of hearing by rarefaction and condensation is noticeable in this case.

CASE III.—Patient about three-fourths African, age 30. She first came under my observation at the New York Eye and Ear Infirmary on August 29, 1878. She stated that she had been deaf for seven months, and she thought it originated from a cold. On examination she is found to be absolutely deaf to all external vocal sounds, and is not aware of being able to hear anything. The deafness came on by degrees in a rather brief period of time. Before she was entirely deaf the rattling of dishes, when washed, sounded painfully loud, as though they were being broken. She describes the tinnitus at the commencement of the attack as resembling the humming of bees, but at the present time there is a roaring, which seems to "jar" her. She sleeps badly, one cause of which is, besides her general anæmic state, the alarm occasioned by the noises heard in her head. The symptoms of syphilis are, that some six months ago she had an eruption, sore throat, and falling of the hair, together with rheumatism. There are now glandular swellings on the neck below the mastoids and on the back of the neck. There are also some old cicatrices on the neck. A vibrating tuning-fork is heard when placed on the teeth.

The right tympanic membrane has a thickened appearance, and is moderately dull, a faint cone of light only being observed. The plane of the membrane is about normal. The left membrane presented about the same appearances.

The *meatus* are at their entrance large and oval, but towards the membrane their calibre is smaller and slightly denuded of epidermis. She is subject to occasional attacks of dizziness, and when she attempts to stand with closed eyes and feet placed together she falls backwards, nor can she walk with her eyes shut without a similar result. She describes a sensation, experienced sometimes when walking, as though she were being lifted up by springs underneath her feet. For the most part she hears her own voice when talking, but sometimes it suddenly becomes inaudible, or partially so, and then she is unable to regulate the pitch. At such times she

unexpectedly elevates or lowers her voice, regulating it by its sound as heard by herself, a proceeding that embarrasses her very much, and also astonishes her auditor.

To-day while undergoing examination she could not hear herself scream. Later, when hearing better, she is requested to utter the letters of the alphabet, and she hears A best of all, and U and W pretty well. Consonants are not so well heard. While the examination is proceeding there is an exacerbation of the noises in her "ears and head" (probably from the excitement), and she cannot distinguish her own voice when talking.

To ascertain whether the drums contained any fluid I decided to make a perforation in one of the drum membranes, which operation was accomplished by pushing a chisel-shaped myringotome through the posterior segment of the left. No fluid was present in the tympanum opened, and I did not operate on the right side.

*Sept. 2.* The perforation made in the left membrane has healed, and the only result which immediately followed the operation was an increase of the noises heard for a short period of time. She is to take potas. iod. gr. iv every four hours.

*5th.* She is less dizzy, and can stand better with her eyes closed and feet together than before. She can hear her own voice most of the time, and it sounds "distant." Hears vibrating tuning-fork on chin and in left ear when placed on left mastoid. There is some tenderness in ears, which may be the result of so much handling.

*April 9, 1879.* The patient, not having been much encouraged as to the prognosis of her case as regarded her hearing, placed herself under the care of a gentleman connected with a charitable institution, and he, having also diagnosed syphilis ("cerebral syphilis"), gave her iodide of potassium in large doses. "During the treatment," he says, "she had several epileptiform seizures, some of them accompanied by eclampsia, others appeared to be '*petit mal*.'" He thought she was improved by treatment. The patient, who came to me again to-day, says she was in the institution referred to above for about four months, that while there under treatment she was weak, restless, and nervous. Some glands beneath right ear suppurated twice, etc. An examination to-day of the right membrane shows that its mucous coat is hyperemic, as well as the border of the external layer where it joins the integument of the meatus externus. There is slight retraction of the membrane, and the cone of light is fairly well marked. The left membrane does not differ much from the above. She now experiences buzzing and roaring noises in her ears, with occasional sounds like the discharge of guns. Usually she hears her own voice in its natural tone, but it is, however, subject to changes to "hoarse or distant." She hears herself sing but not whistle. The vibrating tuning-fork is heard on teeth and mastoids but not on vertex. She is absolutely deaf as to the voice of others, but has learned to comprehend remarkably well by reading the lips. She can hear my voice when I speak through the mouth trumpet with its small end placed far back in her mouth, but cannot understand anything said.

**CASE IV.**—An Englishman, aged 21, consulted me September 14, 1878. His hearing was always good until two years ago (1876) when he was taken violently ill, and had vomiting and dizziness, with sudden and absolute deafness in his left ear, which he describes as coming on like a pistol shot, but without the presence of other noises. Immediately preceding this attack he was operated on for some affection of the eyes. At that

time iodide of potassium was administered. This was in London, and shortly afterwards he returned to America. During the past summer (1878) he was in poor health, and on the night of July 21, he became dizzy after going to bed, and experienced a cracking noise in both ears; (perhaps both ears were invaded alike). In the morning he awoke with retching, and found that he was absolutely deaf in the right ear as well as in the left. He has experienced a great many indescribable noises in both ears ever since. At the present time the noises in the right ear are like the singing of a "Virginia mocking bird" and the ringing of bells. He is now anæmic and much run down, and requires the presence of an attendant when on the street. He has a great deal of vertigo, objects seeming to go around and up and down. If he stands with his feet together and closes his eyes, he at once falls to the right, and on attempting to walk he staggers about like a very drunken man. Since his disease began, over two years ago, he has suffered greatly from frontal headaches, the pain extending to the vertex. Of late these attacks are more severe. His tongue is clean, the pulse 80 and regular. His mother and an aunt are very deaf, and an uncle died of consumption. He himself seems to be a subject for catarrhal inflammation. For some years as he states, he has been subject to seminal emissions which have given him considerable concern. Although he does not admit having had syphilis, he has had attacks of sore throat, and is not at all frank in his manner when questioned on this point.

The *meatus* now contain a tenacious substance, which is light coloured, and is intermixed with some cerumen, preventing a view of the membranes. Most of it being removed by syringing, the right membrane was found to be coated by an ashy-white humid exudation, and the left membrane was white in colour and lustreless, the malleus handle being quite red. The patient informs me that formerly his face was highly flushed much of the time. The skin of the auricles and mastoids is hyperæmic. With the second dentition he had much toothache, and now he has just cut the two upper wisdom teeth, their direction being rather outward. The inferior wisdom teeth have yet to appear. He has one carious tooth which is ragged, and his throat is slightly catarrhal.

He hears his own voice distinctly, the distinctness, however, frequently varying for a few moments at a time, which the observer can detect as he elevates or depresses his voice to correspond with his own estimate of its proper pitch.

He hears absolutely no outside voice in the left ear, but in the right ear he can hear sound when I strike the metal bougie on a tuning-fork held close to the ear. The vibrating tuning fork is heard on either mastoid, and on the teeth. When the external *meatus* are closed by pressing the tragus against the meatus by the fingers, the voice of the patient and the tuning fork on the cranial bones are heard more loudly. His voice to himself sounds like a voice coming from down in a well. When he screams or speaks very loudly, the sounds have to him a metallic quality like striking together two pieces of metal, and my own voice carried to his ears by trumpet has same character. His ordinary voice heard through conduction of tissues from his vocal chords to his ears is muffled. Very low tones of little intensity uttered close to his ears are very painful. He is given hydrobromic acid.

21st. The left membrane is observed to be greatly retracted, and there is a state of hyperæmia at its anterior superior quadrant extending on to

the meatus externus; the inner extremity of the latter is also narrowed by its swollen integument, and it is tender.

Looking into the right ear, it is found that the inner extremity of the meatus is hyperæmic, and disposed to bleed when touched by the speculum, the membrane still coated by a sort of exudation which has been softened by the application of a weak solution of glycerine in water. After its removal by syringing it is found to be a good sized mass, which looks like exfoliated epidermis. The membrane is now free to inspection.

Patient has better general health but the cough is still harassing; the dizziness is less. The patient's condition now being favourable, I decided to begin with one-fiftieth of a grain of the red iodide of mercury, to be taken three times a day shortly after eating. The hydrobromic acid which had a good effect now to be used only when required.

23d. Patient fancies he can hear the singing of a canary bird more distinctly, as well as the sounds of ringing bells, rattling of dishes, and the voices of children, etc. Of these fancied improvements I entertain some doubt, as the patient is hopeful of cure, and does not doubt for a moment that he will ultimately recover his hearing. If the gravity of his disease were fully realized, it was believed by myself and his friends that he would commit suicide.

To-day I examine his hearing power by the highest and lowest tones of my own voice. Both are to him painfully high in pitch, as he himself states it, "so high that he cannot hear it." Bells have a cracked sound, and there is a vibratory, metallic quality to all sounds heard. When I speak to him through a mouth trumpet—a tube of two and a half centimetres in diameter, fitted with suitable tips of vulcanite, and when in use extending from observer's mouth into that of the patient—he hears my speech of both high and low tone, but it all seems to him "low and rumbling, or gruff." The tinnitus in left ear is constant; in the right ear it is variable. The condition of the membrane is about the same.

30th. Patient still complains of "weakness of the knees and ankles," but his cough is better. He says he heard voices in the horse-car this morning, and he hears a vibrating tuning-fork held near the right ear. Treatment continued.

Oct. 5. Patient gains in strength. Dr. A. H. Buck, who now saw the patient, agreed with me that the mercury should be pushed, and he was accordingly given—R. Hydrg. bichlor., gr. j; Potas. iod.  $\bar{\text{ss}}$ ; Syr. sarsaparilla co.,  $\bar{\text{iv}}$ . M. A teaspoonful three times a day, together with mercurial inunctions.

7th. The inunctions continued, but the mixture stopped, and tablets containing one-fiftieth of a grain of iodide of mercury resumed.

12th. Treatment continued, although the stomach is slightly disturbed by colic, and he experiences some sweating of nights. In both ears there is a feeling like the presence of fluids, and he has some vertigo.

15th. The noises are observed to increase by exercise; they are like "blood sent to the head." Patient's general health improving, and he hears more sounds from without, but they seem abnormally high in pitch. On piano all the notes are heard up to middle C; after that he only distinguishes a rumbling sound. He has ascertained that he can tell whether he is singing high or low. When I speak loudly in his ears, it is heard as high, and a hissing noise sounds like whistling. The experiments, when repeated through the mouth trumpet, seem to be heard normally. All the sounds heard through mouth are distinguished, he believes, by the

right ear. In the left ear the loudest sounds feel like "something being poked into the ear," and not as sound usually is heard. There is tinnitus at times like cracking, and when he is quiet whistling is heard. Patient frequently speaks of hearing a rushing of blood. His general health is improving.

24th-28th. The mercurials were pushed more actively.

Nov. 21. The treatment was uninterruptedly maintained until the present, when the patient is compelled to cut short his stay in New York. There was no decidedly constitutional effect from the medicine. His hearing was only slightly modified during his treatment, and when he left he could hear no conversation, even through a trumpet. His general health, however, was greatly improved.

It should be stated that in none of these four cases were the throat symptoms very prominent, nor were the Eustachian tubes found to be obstructed in any of them. In fact, from all that I can glean from the literature of this subject, and from my own observations, I incline strongly to the opinion that syphilitic lesions seldom, if ever, reach the middle ear by continuity of tissue from the throat.

That these cases were syphilitic, I feel quite sure; for, besides the history of the cases, we know of no cause which produces such peculiar and decided symptoms of deafness. For some of the recent literature bearing on the history of such cases, we need go no further than the authors of America.<sup>1</sup>

These affections are seldom suppurative, although in all of my cases there was a history of considerable hyperæmia of the middle ear, which also showed itself in the integument of the external auditory canal. There is a point of interest in these cases to which, as far as I know, attention has not yet been drawn by writers on this subject. I allude to the pre-existing state of hyperæmia in the drums, either from cold or from a sympathetic irritation associated with some affection of the mouth or throat, thus inviting, as it were, an invasion of the drum by the specific affection, an example of which is seen in Case IV., where there was not only a decided catarrhal habit, but the irruption of the wisdom teeth is superadded. As regards the behaviour of syphilitic inflammation in a closed cavity like the tympanum, we know that the result is most destructive to normal hearing, although not suppurative, and that the destructive process probably consists in an exudation, or the deposition of new plastic material, that interferes with the normal functions of the conductive apparatus. The retraction of the membrane seems to depend on causes other than the absence of free Eustachian tubes.

There would appear to be a contraction of the mucous lining of the drum,

<sup>1</sup> Those interested in the literature of this subject can consult a paper by Dr. Knapp, entitled "A Clinical Analysis of the Inflammatory Affections of the Inner Ear," *Archives of Oph. and Otology*, vol. ii. 1871; Dr. Roosa's "Treatise on the Ear," 4th edition, page 485; Burnett's "Treatise on the Ear," 1877, page 568; Dr. Albert H. Buck, "Syphilitic Diseases of the Ear," *American Journal of Otology*, January, 1879.

the membrane under these circumstances having a wrinkled appearance. The labyrinth in these cases seems not to be greatly involved, for the auditory nerve responds fully to the sounds conveyed to it, whether from the patient's own vocal chords, etc., or the vibrating tuning-fork placed on the skull. That the immobility of the membrana tympani and the pathological condition of the chain of ossicles (separating the malleo-incudal or stapedo-incudal joints, or fixation of the stapes in the oval window) are sufficient to account for all the phenomena of audition as described in the four cases above cited, I have no doubt. The slight changes in this apparatus, capable of deranging audition, may be better appreciated when it is remembered that the range of the excursions occasioned by sound waves is from 16 to 45,000 per second. The attention of the reader is drawn to the progressive changes in the appearance of the membrane observable in some of the cases above reported. The deafness in these cases is not always sudden, nor do both ears always become affected simultaneously, although I am inclined to believe this is the rule. My own explanation of these anomalies has been attempted elsewhere.<sup>1</sup>

That the labyrinth or any portion thereof, as the cochlea, may fail in the performance of its functions may be sometimes the case, but in the class of which those cited in this paper are examples, the writer considers such an explanation as improbable.

There is one striking phenomenon observed in nearly all the cases I have seen, namely, the high pitch, if I may so designate the condition, of all sounds heard under certain conditions. I have observed this symptom in acute inflammations of the middle ear, and I believe it must have often been noted by other otologists, but perhaps described by them as relating to "false" or "double" hearing. The latter, however, is simply a condition of autophony, while the "high pitch" of sounds heard seems to depend on some physical anomaly of the conductive apparatus not yet ascertained. Patients have informed me that the heavy concussions of a loaded truck passing over the pavement, or the rumbling of the elevated railway trains in motion, produce a painfully high-pitched sound, like a whistle. One can imagine that owing to the abnormal state of the conductive apparatus some sounds can make no other impact on the drum-head than is normally produced by the sound of whistling. What such a condition is we must leave for the physicists to determine.

This syphilitic affection of the ears has not been found to be a painful one, although the noises heard in the ears by the patients, together with the autophony usually present, render it very distressing. Most frequently patients designate these phenomena as "pain" or as "something throbbing or pulsating in the ear," etc., and a close examination is necessary in order to reach a differential diagnosis as regards the pain and the noise.

<sup>1</sup> Vide "The Relations of the Conducting Mechanism of the Ear to Abnormal Hearing," Transactions of the American Otological Society, 1878.

As for the treatment, it must be confessed that the results so far obtained do not warrant a favourable prognosis. Should a case present itself when the aural attack was in its inception, the plan proposed by Wilde, and later by Roosa, to follow out the course of syphilographers under such circumstances, *i. e.*, attack such special manifestations of the disease with decided antisyphilitic medicines, might be attended with a greater degree of success, but inasmuch as the lesion is not ushered in with pain in the ears, the critical time when such treatment would be serviceable is usually lost before the aurist is consulted.

*Conclusions.*—1. Syphilitic affections of the ear inducing sudden deafness are of exceptional occurrence, and—

2. They would seem to be induced by a pre-existing hyperæmia in the ears, excited by sympathetic relationship or by an intercurrent attack of aural mucous catarrh.

3. The attacks are characterized by their sudden occurrence, and both ears are usually affected simultaneously, although the contrary sometimes takes place.

4. The deafness is always very great.

5. This syphilitic affection speedily causes a disarrangement of the integrity of the chain of ossicles, most likely at the malleo-incudal joint, probably in some instances at the stapedo-incudal joint, or both of these. The movements of the stapes in the oval window are also likely to be interfered with. The two first-mentioned conditions serve to explain the noises in the ears, and the autophony; the last-mentioned condition would increase the anomalies of hearing.

6. The affection does not depend, so far as we know, on anomalies of any portion of the labyrinth, although the latter of course is liable to invasions from syphilis with the nature of which we are as yet unfamiliar.

7. The disease is usually unattended by pain in the ears, it is non-purulent, and its incurability is a characteristic.

*Addendum.*—Before leaving the subject of syphilitic affections of the ear, it may not be out of place to allude to a remote cause of deafness which may arise from syphilitic inflammation of the throat, whereby the soft palate has become adherent to the posterior and lateral walls of the pharynx. In five of such cases which have come under my observation there was found to exist a mechanical obstruction of the pharyngeal mouths of the Eustachian tubes which was the cause of the deafness.



## ARTICLE III.

ON SO-CALLED HERNIA OF THE TRACHEA, WITH A CASE OF INCOMPLETE INTERNAL FISTULA OF THE TRACHEA (OR LARYNX), ACCOMPANIED BY THE DEVELOPMENT OF AIR SACS. By STUART ELDRIDGE, M.D., late Lecturer on Anatomy in the Medical Department of Georgetown University; Surgeon of the General Hospital of Yokohama, Japan.

FROM time to time cases of a rare disease have been reported under the various titles of Pneumatocele, Aerial Goitre, Aerial Bronchocele, Tracheocele, and Hernia of the Trachea. Having recently met with an interesting example of this unusual lesion, I believe it to be worthy of record.

Gustave Schneider, German, sailor, aged 26 years, came under my professional care as follows: During the night of July 11, 1878, I was called to the police station to see a case suspected by the officers to be one of foul play. I found a robust sailor in a state of insensibility, darkly cyanotic, and breathing with the utmost difficulty; both inspiration and expiration being accompanied by a loud grunting whistle. The patient had been brought to the station in a jinrikisha (a small vehicle drawn by a man), in which he had taken passage fifteen minutes before, apparently well, though slightly intoxicated. The coolie drawing the carriage noticing that something was wrong with his fare, examined him, found him insensible, and at once took him to the police station. The character of the respiration indicated laryngeal obstruction, and examination by the finger failing to reveal the presence of any foreign body, in the absence of proper instruments for examination and tracheotomy, and considering the suddenness of the attack, the cold douche was applied to the head and neck, which gave speedy relief to the urgent dyspnœa, and the patient was soon able to give an account of himself, although some difficulty in breathing persisted. My colleague, Dr. A. Goertz, coming in at this moment, called my attention to an apparently goitrous tumour upon the front of the neck.

The patient was somewhat inebriated, but able to give a clear description of all that had taken place prior to his seizure in the jinrikisha. As soon as possible the sufferer was removed to the General Hospital, where, as he gave a history of sudden attacks of dyspnœa on several previous occasions, while the circumstances of the paroxysms which had just occurred, the relief of which was followed by a perceptible diminution in the size of the cervical tumour, seemed to point to an element of congestion in its etiology, dry cups over the tumour were ordered, together with chloral and potassium bromide.

A severe attack of dyspnœa came on about two hours after the arrival of the patient at the hospital, which, however, was quickly relieved by dry cups and cold affusion.

*Examination July 12, 1878.*—The history given is as follows: In December, 1877, patient found that his breathing was occasionally slightly noisy and difficult, and that at such times the front of his neck, on either side of the trachea, seemed to swell a little. The difficulty of breathing and the size of the swellings gradually increased until the end of January, 1878, when he had a severe suffocative attack of dyspnœa, after severe exertion in going aloft rapidly. After this time both dyspnœa and tume-

faction, hitherto paroxysmal, became constant, though only occasionally very great. On the whole, however, since January the swelling of the neck has steadily increased, and the attacks of severe dyspnœa have become more frequent. Asserts that in coughing, or when the difficulty of respiration is greater than common, the tumours of the neck become much larger; further, by attempting forced expiration, with the mouth and nose closed, he is able to increase the swelling at will. He is at present a sailor, but has worked on a farm and as attendant in a beer saloon; has often used violent exertion both as a gymnast and at ordinary labour: has no knowledge of the occurrence of any similar affection in any member of his family.

The patient is a large, well-nourished man, bullet-headed and thick-necked. Superficial examination detects nothing abnormal in any portion of the body, save the tumour in the thyroidean region above alluded to. Breathing hurried and noisy, with the usual characteristics of partial laryngeal stenosis. Upon either side of the lower larynx and upper trachea, in the situation usually occupied by the lobes of an hypertrophied gland, lie soft flattened tumours measuring each, vertically, about 6 centimetres in diameter, and horizontally about 8 centimetres in diameter. Palpation indicates a thickness of about 1.5 centimetre. The tumours are not very distinct to the eye, although the front of the neck looks abnormally full. The thyroidean isthmus is thicker than usual, and seems to lose itself on either side in the flattened tumours above described, of which the anterior walls seem to be formed, at least in part, by the thinned and expanded glandular lobes. The tumours appear to be covered by skin and fascia only, and to overlie the cervical muscles. On attempted expiration with the mouth and nose closed, the tumours more than double in thickness, standing out independently, without connecting enlargement across the front of the trachea or larynx. The increase in the size of the tumours, although chiefly in thickness, amounts to about one centimetre in both diameters, as well. On free expiration the tumours immediately subside to their ordinary dimensions. Percussion and auscultation of the region involved, while no artificial obstruction is offered to the free passage of the air, give but negative results beyond the sound produced by the slight degree of laryngeal obstruction which is constantly present. Even during the enlargement of the tumours, caused as above described, there is no tympanitic resonance, nor are there any abnormal sounds under auscultation. The sensation conveyed to the fingers when the tumours are at their greatest size is exactly that of a cystic enlargement of the thyroid, though no fluctuation can be detected. Measurement of the neck under ordinary circumstances, 40.5 centimetres; during the performance of forced but obstructed expiration, 49 centimetres. Deep pressure, close to the cricoid cartilage on either side, during attempted expiration, while it does not entirely prevent the enlargement of the corresponding tumour, it causes it to increase its dimensions far more slowly, and, *vice versa*, upon the air pressure within the trachea being removed, to diminish in size less rapidly. Very firm pressure in this situation is impossible, as it brings on laryngeal spasm.

The voice is somewhat hoarse and low, and, although the laryngoscope fails to detect any abnormality in the structure of the parts, sluggish action of the laryngeal muscles is evident. It should be mentioned that during the severe attacks of dyspnœa the inflation of the tumours was far more extensive than when induced by the voluntary action of the patient. On

one occasion when, owing to spasm, the tumours were tensely distended, the needle of a hypodermic syringe, plunged into the most prominent portion of the tumour upon the left side, gave exit to a stream of air forcible enough to extinguish a lighted match.

Tracheotomy was undoubtedly indicated, but as the patient declined the operation, and, during his stay in the hospital there was no attack of dyspnoea so severe as to demand surgical interference for the preservation of life, the operation was not performed. Inunctions of ungt. iodinii and hydrarg. oleat. were made over the tumours, and with some apparent benefit, as the thickening of tissue became less, and the paroxysms of dyspnoea were less frequent and severe, during the time of stay in hospital averaging about one per week.

Schneider remained under observation until Oct. 24, 1878, when, by order of his consul, he was sent home, still refusing the operation of tracheotomy, which would probably have insured him against sudden danger. The worst attack of dyspnoea which occurred during the latter part of his stay in the hospital, took place after he had been out on leave and had indulged in a small amount of liquor.

With the very limited facilities for reference at my disposal in this out-of-the-way corner of the earth, I am unable to undertake anything like a full analysis of the literature of cases such as that above reported. I find, however, no mention of this form of tumour in most of the leading systematic works on surgery, English, French, German, or American. Gross (ed. 1862, vol. ii. p. 441), under the heading of Hernia of Trachea, alludes to protrusions of the lining membrane of the trachea between its rings, causing median or unilateral tumours from the size of a pea to that of a pigeon's egg. Rokitansky (*Pathological Anatomy*, Am. ed., 1855, vol. iii. p. 48) mentions certain sacciform diverticula of the trachea, and is stated by Jones and Sieveking (*Pathological Anatomy*, 1st ed., Lond., p. 395) to ascribe these to hypertrophy and dilation of the muciparous glands. Riegel (*Ziemssen's Cyclopædia*, vol. iv., Am. ed., p. 289) briefly dismisses the subject as follows, limiting it, it will be observed, to congenital occurrence:—

“Congenital bronchocele (so called), partial dilatation or hernia of the trachea, must also be mentioned as a very rare malformation. In reference to this malformation Ammon (*Die angeborenen chirurgischen krankheiten des Menschen*, Berlin, 1842) says: ‘There exists a single and a very incompletely described case of congenital bronchocele reported by Gohl; in this instance there was a complication with struma; the increase of the tumour on inspiration and in crying, as well as the unaltered condition of the tumour on expiration without crying, showed the existence of the complication with bronchocele.’”

Further on, in connection with congenital fistula of the neck, he gives a case which, although the report is imperfect, appears to me to have been of the same nature as that quoted by Ammon.

“A child, twelve years old, when in the fifth year of its age, had a tumour form some two inches above the manubrium sterni, and tolerably in the middle line between both sternal portions of the sterno-cleido-mastoid muscle. The tumour had been opened by means of some caustic, which left a small ulcer and a fistula. The probe penetrated about an inch and a quarter upwards, and gave

exit to a stringy, tenacious mass, which contained mucous corpuscles. The first impression was that this was a case of congenital fistula of the neck; a diagnosis, however, which was excluded by inquiry into the history of the case. Apparently a lymphatic gland had undergone suppuration, and the abscess formed had descended and become ruptured lower down. The tract was cut open. It appeared clothed with epithelium, and could be followed as far as the level of the thyro-hyoid ligament. It was excised, together with the cicatrix of the ulcer. During the union of the wound air bubbles escaped repeatedly, indicating, therefore, a communication with the air passage, so that the case was explained as one of congenital fistula of the neck. (Fischer in Pitha and Billroth's *Handbuch*, Bd. III., 1 Abth. 3 Lief.)"

The most detailed description of the affection, which I have been able to find, are those of Gayet, Devalz, and Faucon. Gayet's case (*Mémoires de la Société des Sciences Médicales de Lyon*, quoted in *Ranking's Abstract*, Am. Rep., vol. xlv. p. 152) is reported as follows:—

"In October, 1867 (?), a man whose occupation was that of a joiner, came under the care of Dr. Gayet for chronic irido-capsulitis. Whilst he was under treatment, Dr. Gayet noticed by chance that there existed at the lower part of the front of the neck a swelling, which from its nature was remarkable and worthy of attention.

"The patient first noticed that there was a tumour in the neck nine months before; it was then seated in its present locality; was at first very small, and then gradually increased until it presented itself as a marked deformity. Dr. Gayet states, that at the first glance the swelling might have been taken for a median cystic goitre, but a short examination prevented such an opinion from being held for any length of time. The tumour appeared to be influenced, up to a certain point, by the state of tension of the sterno-mastoid muscles, under the inner margins of which it passed. Whilst the muscle was in action, the tumour became prominent, hard, and elongated from below upwards; in relaxation of the muscle, on the other hand, it became soft, and diminished in size. It was also influenced very much by the respiratory movements; it was swollen and distended by violent and prolonged respiration, and during a deep inspiration it seemed to disappear. To the touch the swelling felt very soft, and it was almost entirely reducible, but the finger could still make out under the skin the existence of a sac with moderately thick walls.

"These characters alone, states Dr. Gayet, pointed out the nature of the swelling, and it was, without doubt, one of those formations described by Frank, Bach, and others, under the names of aerial goitre, tracheocele, etc., a tumour formed by a sac, communicating with the trachea by an orifice more or less extensive, and which, according to the state of tension of the respiratory passages, was empty or again distended with air.

"Two questions in cases of this kind naturally present themselves. What parts form the wall of the cyst? At what part of the trachea does the communication exist?

"Dr. Gayet thinks that from the thinness of the walls of the cyst in his case, no part of the thyroid gland could have been involved; there was nothing to authorize the supposition that in puncturing the cyst in the middle line, any other tissues save skin and fascia would have been traversed by the instrument. The isthmus of the thyroid gland was, Dr. Gayet thought, either above or below the pedicle which passed from the swelling to the trachea.

"With regard to the second question, the true position of the communicating orifice was probably below the cricoid cartilage. Dr. Gayet could not feel it, but it was by careful pressure on the sac at this point alone that, after the goitre had been reduced, the appearance of the swelling would for a time be prevented, even with very forcible efforts on the part of the patient.

"In this case, as in all others previously observed, the tumour was not sonorous on percussion, and no special bruit could be heard by the stethoscope.

"Nothing was learnt from this case that could throw any light upon the mode of origin of such formations.

"Three statements on this point have been put forward, but they have been derived more from hypothesis than from observation.

"1. Laceration of the mucous membrane, followed by quick expulsion of air into the cellular tissue of the neck. This would produce emphysema rather than a true tracheocele.

"2. Laceration of the mucous membrane, followed only by a succession of limited expulsions of air, thus permitting the gradual formation of a sac.

"3. Hernia of the tracheal mucous membrane between two of the cartilaginous rings, whence the formation of a cavity having the inner surface of its walls supplied with epithelium.

"No post-mortem examination has yet been made in a case of this kind.

"It is an important fact that this form of goitre is generally produced under the influence of repeated and sustained bodily exertions. Heavy occupations and singing expose individuals to the affection.<sup>1</sup> According to Larry it has been observed in those Mussulmans who from the summits of the minarets call out hours.

"Surgical interference would be worse than the disease. The most the surgeon can do is to recommend an apparatus designed so as to inclose the swelling, and to prevent further expansion of the cyst."

Cohen (*Diseases of the Throat*, ed. 1872, p. 395), under the head of fistulæ of the larynx and trachea, briefly notes two cases which he presumes to have been cases of "subcutaneous fistula," which were accompanied by the occasional development of a large irregular tumour containing air, the tumour after a little time subsiding. He characterizes the tumours as emphysematous, and states that the laryngoscope failed to detect any abnormal opening.

The cases of Devalz and Faucon above alluded to are condensed in the *Biennial Retrospect of the New Sydenham Society*, for 1873-4, p. 313, as follows:—

"*Hernia of the trachea*.—At a meeting of the Surgical Society of Paris, on October 1, 1873 (*Gazette des Hôpitaux*, 1873, 129), M. H. Devalz related a case of tracheocele which had come under his notice. Ten years previously, while suffering from an attack of bronchitis, attended with violent cough, the man observed a swelling in the middle of his neck, which rapidly increased. It was at first supposed to be a goitre. Devalz perceived a peculiar murmur, audible with the patient's voice, and sounding something like a very softly uttered 'uwuwu.' The width of the neck at the lower part was increased by strong expiration; when the patient coughed a pyriform swelling was formed on each side of the trachea, giving the appearance of hypertrophy of the lateral lobes of the thyroid gland. On inspiration the swelling collapsed. The right lobe of the swelling extended as far as the clavicle; the left did not. The appearance of the swelling could be prevented by pressing on the trachea. The tumour had a smooth surface, was soft, and readily compressible. Examination of the chest gave normal results, except that in the right subclavian region there were amphoric breathing and pectoriloquy, which ceased when pressure was made on the trachea. The opening in the trachea could not be found by palpation. M. Devalz advised the patient to press on the trachea during coughing, so as to retard the further increase of the sac.

"Faucon relates in the *Archives Médicales Belges*, for January, 1874, two cases of tracheocele, or hernia of the mucous membrane of the trachea. In the neighbourhood of Arras he had under his care a man, æt. 54, who had, to the right of his trachea a swelling of the size of a hen's egg, like a one-sided bronchocele. It differed from this, however, in being soft and elastic, and in being increased in size by coughing, hawking, and blowing the nose. The increase could be felt

<sup>1</sup> [Conf. J. P. Frank (*Epitome*, cap. vi. § 707) on emphysema of cheeks produced by playing on wind instruments. S. E.]

on the application of the hand. Between the larynx and the sternum, on the right side, was a tumour flattened from before backward, divided into two lobes, of which the upper was the smaller; they had the feel of a rabbit's bladder distended with air. Pressure on the vessels above and below produced no change in the tumour. Percussion gave a tympanitic sound, establishing the diagnosis of a hernial protrusion of the tracheal mucous membrane, filled with air. The patient had had the swelling for ten years. It was at first of the size of a walnut, it commenced above and extended downwards. At first it appeared only when the man exerted himself, and receded spontaneously, or under slight pressure. In reducing it the escape of air could be perceived by the finger; but no sound was produced. The difficulty of reduction increased with the duration of the swelling, and to the end of the patient's life it remained as a visible tumour as large as a hen's egg. His voice was like that of a woman. He said that the tumour first appeared during the act of vomiting. As he had suffered for many years from frequent attacks of bronchial catarrh, the origin of the tumour might be due to the repeated paroxysms of coughing.

"In a second case, a child a year and a half old, with a congenital deformity of the lower jaw and lip, and of the neck and sternum, had a swelling of the neck, regarding which it was uncertain whether it was a dilatation of the internal jugular vein, or a hernia of the tracheal mucous membrane. On performing a plastic operation it was found that there was a tumour unconnected with the vessels, along with a tracheocele. The latter was produced by exertion, receded spontaneously, and could also be reduced. It was diagnosed to be the result of a congenital defect in the lining membrane of the trachea."

The following table presents the leading points of the cases noted:—

No.	By whom reported.	Sex.	Age at appearance of tumour.	Situation of tumour.	Auscultation and percussion.
1	Eldridge	Male	25 years	Bilateral	Negative.
2	Gohl (Riegel)	Not stated	Congenital	Not stated	Not stated.
3	Fischer (Riegel)	Not stated	5 years	Median	Not stated.
4	Gayet	Male	Adult	Median	Negative.
5	Cohen	Male	Not stated	Median	As in emphysema (?)
6	Cohen	Female	Not stated	Median	As in emphysema (?)
7	Devalz	Male	Prob. adult	Bilateral	Soft murmur "uwuwu."
8	Faucon	Male	44 years	Unilateral	Tympanitic
9	Faucon	Not stated	Congenital	Unilateral	Not stated.

The tumours are described as well defined in all the above cases, except those of Cohen, the brief description of which conveys the impression of a more or less diffused emphysema, rather than that of a distinctly sacculated condition of the parts.

Of the nine cases, five developed after the age of five years, three of the five being adults, and a fourth almost certainly of mature years; two were congenital, and of two nothing is stated which would indicate the age at which the tumour first appeared. In regard to the situation of the tumours, in two it was bilateral, in two unilateral, in four median, and in one is not stated.

The case of Devalz bears the closest resemblance to my own in all essential points, save the existence of a soft murmur under auscultation. In reference to this point it will be observed that of the cases in which

the result of auscultation and percussion is distinctly stated, in two it was negative, in one a soft murmur was heard, and in one the tumour was tympanitic. While Devalz states that in his case, as in all others of which he had knowledge, the result of auscultation and percussion was negative, Faucon appears to have based his diagnosis of one case chiefly upon the presence of a tympanitic resonance. It is, however, evident, in view of the facts, that while tympanitic percussion, or aerial bruit, if present, would be strongly confirmatory of the existence of pneumatocele, their absence would by no means forbid such a diagnosis.

I believe all the cases of this character to be most easily explicable on the supposition of the existence of blind or incomplete internal congenital fistulæ of the neck, due, as are external fistulæ colli, to the persistence of the branchial clefts or want of union of the branchial arches in the middle line, as long ago described by Dzondi (*De fistulis tracheæ congenitis*, Halm, 1829) and Ascherson (*De fistulis colli congenitis*, Berolini, 1832). Of the cases of this rare malformation (fistula colli) a large proportion are incomplete, or, at least, in comparatively but few cases has the communication with the internal canals been clearly established. Is it not quite possible, indeed probable, that a similar condition of fistula may exist in which the more external tissues have united, while defect of one or more of the inner layers remain? It is not necessary to assume a condition of patency as regards the inner wall of the air passages. Defect of any layer of this would leave a weak point, ready to yield to any unusual or violent pressure from within, either as a laceration, with consequent emphysema, which is least likely to occur, or as a hernial protrusion. The latter seems to have been the condition in all the cases above noted, save, perhaps, those of Cohen. We do, in fact, find in certain cases of externally apparent fistula colli, a sacculated condition of the tissues near the external opening of the fistula, which only requires the closure of the skin and the insuring of free communication with the air passages to be converted into an air-containing tumour.

That out of the nine cases noted the tumour was bilateral in but two is so far from militating against the idea that the condition is invariably due to congenital fistula, that it strongly confirms it. It is difficult to conceive of the formation of symmetrically bilateral tumours on the supposition of accidental laceration of tissue or of dilation of muciparous follicles. That of the few cases analyzed but two were bilateral is not extraordinary, in view of the exceeding rarity of bilateral fistula colli, a condition which, when found, is invariably symmetrical. (Riegel, *loc. cit.*, Bardeleben, *Lehrbuch der Chirurgie und Operations, lehre* 2te Ausg., Bd. III., p. 426.)

Of the nine cases it will be observed that four were of males, one was that of a female, while the sex is not stated in the four remaining. This large proportion of males disagrees with the observed facts as to the com-

parative frequency of the occurrence of congenital fistula colli in the two sexes. Anderson (*op. cit.*) states that out of eleven cases eight occurred in females, while Bardeleben (*op. cit.*, Bd. III., p. 427) says that up to the time of writing no case of congenital *tracheal* fistula had been observed in the male. Riecke (quoted in Todd's *Cyclopædia of Anatomy and Physiology*, vol. iv. part ii. p. 953) found congenital fistula colli but twice in the examination of thirty-four thousand young men. It may be that the active development of the larynx, which takes place in the male at the time of puberty, may in some aggravate any tendency to the formation of abnormal openings upon the basis of pre-existing weak points: and so, that given an equivalent congenital lesion in individuals of opposite sexes, in the male tumour might result, and in the female no noticeable pathological condition be developed. The number of recorded observations is at best so small that the discrepancy above noticed is hardly entitled to much weight in the discussion of the subject.

Of course, like more facts, those which I have recorded in this contribution are susceptible of more than one interpretation. The appearance of my patient during the inflation of the tumours might easily have suggested to an enthusiastic evolutionist the idea that the case was one of atavism or reversion to the structure of some mycetic, howling ancestor. (Owen, *Comp. Anatomy of Vertebrates*, vol. iii. p. 597.)

As regards the case which I have reported, I am inclined to attribute the always more or less severe dyspnœa not so much directly to the aerial tumours, though the condition was much aggravated by any inflation of the sacs, as to the development of a thick sac-wall, some portion of which was in such a situation as to exercise constant pressure upon the laryngeal nerves, a pressure which would, of course, be increased by the distension of the sac inclosed. As to the presence of distinct and complete sacs there could be no doubt, as the limits of the tumours were uniformly and sharply defined during either collapse or inflation. A sac once established, and thickening of its wall from irritation or subacute inflammation, due to the pressure of air in the tissues, having taken place to an extent sufficient to interfere with respiration under any special circumstances, the then occurring congestion of the parts would necessarily intensify all the morbid conditions, *pari passu*, with which would be the increase of thickness of the sac. The occasional very severe attacks of laryngeal obstruction were probably owing not only to the inflation of the tumours by pressure from within, but to interference with the return of the air, due to congestive swelling of the parts about the opening communicating with the air passages to an extent beyond the power of the tissues to overcome by their mere resilience or elasticity. During one of the attacks of severe dyspnœa, during which, as was invariably the case, the sacs were tensely and persistently inflated, strong pressure on the tumours, while momentarily intensifying the dyspnœa, caused the collapse of the swelling and



temporary relief of the laryngeal spasm. Tracheotomy would undoubtedly have given relief in my case, and it should have been performed. I should have been inclined to go no further in the direction of surgical interference, though it is possible that in a case accompanied by such unique and dangerous symptoms some attempts at a plastic operation might have been justifiable.

I would suggest the need of a more definite and correct nomenclature for the subject of this paper. Tracheal hernia is awkward, and while applicable to some cases, would be incorrect in others. Pneumatocoele is indefinite, and has been applied to a totally different lesion. Aerial goitre and bronchocele suggest an implication of the thyroid which does not exist, I have therefore, as corresponding with what I believe to be the true pathology of the condition, adopted the descriptive title of Incomplete Internal Fistula of the Larynx or Trachea, as the case may be.

YOKOHAMA, JAPAN, February 22, 1879.

POSTSCRIPT.—Since mailing the foregoing, I have received from my friend Dr. Billings, Librarian of Surgeon-General's Office, the following note of reference to cases not included above. So far as one can judge from so brief an abstract, these cases may all have been due to congenital deficiency or weakness of the walls of the air passages.

1. *Bull. Soc. Chir. de Paris*, 1861, 2e Ser. i. 529-530. Emphysematous Goitre. Reported by M. Lizé. Girl, 17 years old, from shrieking in difficult labour developed a gaseous tumour in the right side of the neck; it disappeared in two days.

2. *Mém. Soc. des Sciences Méd. de Lyons*, 1868, vii. 381-384. Aerial Goitre. Reported by M. Leriche. Child, 8 months, double gaseous tumour in the neck from coughing; rapidly cured by simple pressure.

3. *Wochenschr. f. d. ges. Heilkunde*, Berlin, 1836, 361, 368. Gaseous Thyroid Tumour. Reported by Behr. Girl, 14 years old, result of coughing; readily cured.

YOKOHAMA, JAPAN, March 26, 1879.

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#### ARTICLE IV.

A CASE OF TORSION OF THE ILEUM. By JAMES C. WILSON, M.D., Attending Physician to the Philadelphia Hospital and to the Hospital of the Jefferson College, Philadelphia.

AN examination of the statistics of Leichtenstern<sup>1</sup> shows that, external hernias and malignant tumours being excluded, one death from occlusion or constriction of the intestine takes place in every three hundred to five hundred deaths from all causes in hospital practice. This state-

<sup>1</sup> Ziemssen's Cyclopædia of the Practice of Medicine, American translation, vol. viii

ment is based upon the records of the late Dr. Brinton, of London, and the hospitals of Geneva, St. Petersburg, Vienna, and Prague. At the Anatomico-Pathological Institute in the last-named city there were performed from 1845 to 1873 (with interruptions of the records) 13,105 necroscopies with 45 occlusions of the intestine, or not far from 1 in 300. On the other hand, in the Geneva Hospital at Vienna, of 34,523 deaths, 68 were due to this cause, about 1 in 500. In 1541 published cases collected by the same author, and analyzed with reference to the anatomical cause of the occlusion, after deducting 178 due to cancer, 33 cases only (23 in males and 10 in females), or 1 in 42, were due to twisting of the bowel, this including twists of both the sigmoid flexure and the ileum. Upon another page, however, the writer gives the following analysis of cases of twists of the bowel; 45 twistings of the sigmoid flexure, 23 twistings of a loop of the ileum, 8 of the jejunum and ileum combined; in all 76 cases, of which 23, or 1 in 3.3, were instances in which the volvulus affected the ileum only. It is not difficult to estimate in a rough way from these figures that of the total number of deaths from all causes in the general hospitals of large European cities, 1 in nearly 17,000 is caused by the twisting of some portion of the intestinal tube, and 1 in about 55,000 by a twist of the ileum. I cannot doubt that if the truth with reference to the subject could be reached, a relatively greater proportion of deaths from this cause would be found to take place in private practice. For many cases reported, without an examination after death, as "ileus," "peritonitis," or "inflammation of the bowels," may be cases of torsion, the positive diagnosis from acute strangulation from other causes being almost always, if indeed not absolutely always, an impossible one.

I am aware of the danger of over-estimating the importance of this kind of arithmetical consideration of disease. In the first place, the figures relate to what may be termed a special class of individuals, small in numbers as compared with the whole number of the citizens of a community; a class among whom many, by reason of other maladies, are less liable to those accidents of life which tend to determine intestinal disorders of the kind in question, on the one hand, and among whom, on the other hand, there are some whose previous or present disorders made them especially prone to these very occlusions and constrictions. And in the second place no degree of infrequency in the occurrence of any given malady can affect the possibility of one or more cases of it coming under the care of any individual observer, although an extreme rarity would make it quite certain that many practitioners would fail to meet with a single case in a long lifetime of active practice.

The following case is published as an illustration of one of the rarer forms of intestinal obstruction.

Being in the neighbourhood of the home of a patient suffering from advanced dilatation of the heart, consequent upon disease of the mitral valves, on the evening of February 19, 1879, it occurred to me to pay him a visit, as it is my habit to see him at intervals of four or five days. As I was about leaving, his mother requested me to see another of her sons, who was suffering from what was supposed to be a protracted attack of colic. The lad, E. M., a tall, slim, well-formed youth, was called, *and walked into the room*. His aspect was that of one suddenly and gravely ill; his expression was anxious, and indicative of the most intense pain; his face was of a deadly pallor, the features sharp, the eyes sunken and surrounded by dark rings. Seated before me—he refused to lie down upon a lounge in the room—he gave me the first portions of the following account of his brief sickness:—

He was 19 years old; without occupation, save that of occasionally standing at the counter in his brother's cigar shop. He had never been sick. In truth, to use his mother's expression, he had never taken a dollar's worth of medicine in his life; neither had he received any injury to which the existing disorder could in any way be referred. For some weeks he had observed that his bowels were less freely moved than formerly; but there had been an action every day or every second day. The evening before I saw him he had been obliged to work in a cold cellar some twenty minutes or half an hour, in consequence of the bursting of a water pipe; did not strain himself however, was not wet nor chilled, and after a late supper of bread and tea, went to bed at eleven o'clock, as well as ever, and in good spirits. He awoke at an early hour with a desire to pass water, but succeeded in voiding only a small quantity. At this time the first sensation of pain in the belly was felt. At nine o'clock he ate his breakfast, consisting of bread and butter, "scrap-ple," and coffee. Immediately afterwards he was attacked with intense colicky pains in the belly, and vomited copiously, the matters vomited amounting, according to the mother's statement, to more than a quart, and certainly far exceeding in bulk the food he had just taken. He was observed to be very pale, and from this time he presented symptoms of collapse. Vomiting had continued, always provoked by taking fluids, and occasionally occurring spontaneously. The vomited matter, when nothing had been swallowed, was described as of the consistence of thin gruel, light in colour, but as not having any marked odour. Thirst was urgent, and it was only momentarily relieved by water, cold tea, etc., all of which were promptly rejected by the stomach. Since breakfast he had not attempted to take food. He had passed no urine, nor had his bowels been moved since the morning of the preceding day. Pains, colicky in character, had distressed him constantly. He was anxious and restless, and had passed the day in lying upon the lounge, walking about the room, and going back and forth from his room to the shop. Hot applications to the abdomen, and various doses of ginger, brandy, etc., had been resorted to, without success, in relieving the pain, the vomiting, or the restlessness. His tongue was clean and moist; the extremities were cool, the pulse was small, not corded, 120 to the minute. The pain was referred to the region of the umbilicus, where also there was marked tenderness, which extended downwards four or five inches, but was not present elsewhere. There was slight fulness of the abdomen, much marked in the space between the umbilicus and the pubic arch. The whole belly was tympanitic on percussion without localized dulness or sense

of resistance ; no external hernia was discoverable, nor was there tenderness upon pressure over the inguinal or femoral rings, nor in the line of the femoral vessels.

One-third of a grain of morphia was given hypodermically at once, and twenty drops of deodorized tincture of opium ordered every two hours, or every hour if necessary, to relieve pain ; this to be given with a spoonful of crushed ice, by means of which he was enabled to retain it, as I made sure by waiting until he had taken and retained the first and second doses. Cracked ice, spoonful doses of iced brandy and water, and of beef essence, hot constantly renewed fomentations to the belly, absolute rest in the recumbent posture, with the knees supported by pillows, and artificial warmth to the feet, completed the directions for the night.

It was specially insisted upon that no purgative should be administered.

He passed a restless night. The colicky pains, the anxiety and general distress, the torturing thirst, and the inability to retain more than a spoonful of fluid at a time were augmented ; to them were added the fixed pain and tenderness of general peritonitis, a most distressing tenesmus, *the sensation of a rope drawn tight in his belly*, coldness of the surface, a still more cadaveric pallor, and moderate general distension of the abdomen. The tincture of opium had been given regularly, and retained until about two o'clock, when, the symptoms not being relieved, and the desire to have his bowels moved, and the sensation of something in the bowel that must be voided, being extremely urgent, some officious member of the family interfered to stop the medicine, and persuaded the mother to administer "a dose of salts." The evidence as to whether this last was retained or rejected was conflicting. He sat over a bucket of hot water two or three times during the night, with some transient amelioration of the bearing-down pains. His bowels were not moved, no wind was voided, nor did he succeed in passing water, although the attempt was frequently made. Towards morning the vomiting became less frequent.

I found him in the morning decidedly worse ; collapse was profound, the surface everywhere cool, the extremities cold and bluish ; the radial pulse feeble, flickering, uncountable, the heart sounds faint but sharp ; the tongue clean, red, moist. From time to time he expectorated a clear fluid, which collected in his mouth ; nevertheless, thirst was intense, and only relieved for the moment by drink. The abdominal pain was constant, and greatly increased by movement and pressure, the rectal and vesical tenesmus were most distressing. The belly was still only moderately distended, except in the hypogastric region, which was the seat of a prominent symmetrical oval distension, the long axis of which corresponded to the median line, and the borders of which somewhat abruptly trended down to the less decidedly protuberant surface of the abdomen. His mind was perfectly clear ; the anxiety and restlessness continued.

Half a grain of morphia was given hypodermically, and artificial heat applied to the extremities, with sinapisms to the præcordial region and to the wrists and ankles. A catheter was passed, and about two and a half fluidounces of dark-coloured urine drawn off, the accumulation of twenty-four hours. The escape of urine was the occasion of an exclamation of relief from the poor fellow.

A pill containing extract. opii gr. j, ipecacuanha gr.  $\frac{1}{8}$ , hydrarg. chlorid. mitis gr.  $\frac{1}{4}$ , was prescribed to be taken every two hours, and the whole

surface of the abdomen was lightly smeared with the extract of belladonna made soft with glycerine.

In the middle of the day his condition was about the same, save that he was free from pain when quiet, that the tenesmus had ceased, and that the medicine and nourishment in small quantities were retained. There had been no vomiting for four hours. The abdomen was at this time more evenly distended. The anus was not patulous, nor was there at any time any escape of mucus from it.

At half-past three in the afternoon, thirty-two hours after the earliest symptoms, he suddenly became very restless, starting up into a sitting position, and cried out that he was blind. A moment later there was a copious gush of dark thin fluid from his mouth and nostrils, and he fell back dead.

The necroscopy was performed the following day by Mr. Hansell, Dr. Hunter and myself being present. Upon incising the walls of the abdomen there was a free escape of bloody serum; a cross-cut being made, and the walls drawn back, the belly presented a remarkable appearance. The intestines moderately distended with gas apparently occupied their usual position; the colon formed a square, which was filled up by the coils of the small intestine. The vessels showed universal congestion, and the loops of the gut were adherent by a thin layer of very soft lymph. The colour of the bowel, although deepened by the congestion, did not differ to any great extent from the normal, except four or five convolutions occupying the hypogastrium. These were of a deep purplish-black colour, and gangrenous. They were also considerably more distended than the surrounding gut, and taken together they compared exactly with the outline of the circumscribed tympanitic distension observed during life in this region of the abdomen. On careful examination these blackened coils of the bowel were found to constitute a portion of the ileum, five feet in length, tightly twisted upon itself in its mesenteric axis. The lower point of crossing was five inches above the ileo-cæcal valve, the upper a distance above corresponding to the length of the involved portion, five feet. At these two points the gut was flattened out, and, with the corresponding mesentery, tightly twisted upon itself, forming a firm, hard cord-like pedicle, about an inch and a half in length, and a little more than one-third of an inch in diameter; at the distal or lower end of which, abruptly bulged out the globular mass of gangrenous gut, whilst from the upper or vertebral end, branched off in a like abrupt way the two unimplicated portions of the ileum, the upper continuous with the intestinal tube above, the lower passing by a few inches of its lowest part into the large bowel. The twist was from left to right, and amounted to a complete turn ( $360^{\circ}$ ) upon the vertebro-enteric axis of the mesentery. One of the epiploic appendages attached to the sigmoid flexure by a rather long foot-stalk of peritoneum was caught in the twisted end of the volvulus. The intestines both above and below the strangulation were moderately distended with gas; the distension of that part of the ileum included within the twist was somewhat greater than elsewhere. This portion contained a moderate amount of bloody fluid. Its mucous membrane was softened and shreddy. A few lumps of feces of the consistence of putty were found in the upper portion of the colon. At no point in the course of the bowel was there excessive dilatation, or preternatural accumulation of bowel contents; nor were there signs of foregoing inflammatory trouble, such as bands of lymph, old adhesions, and the like. The mesentery of a portion of the gut was unduly

long, that of each end of the same portion short, and by an accident to which this anatomical arrangement had made the lad long liable, those coils of the bowel to which the long mesentery gave increased freedom of motion, turned around the mesenteric axis, the portion involved being limited by the position of the shorter mesentery at each end, and strangulation occurred. The resulting sequence of events was that which takes place whenever there is acute strangulation of the intestine, as in hernia. Deep and rapidly increasing congestion of the strangulated parts, local enteritis implicating all the coats of the bowel, gangrene, and at the same time general peritonitis. Step by step with these processes, the evolution of gases, products of the rapid decomposition of the intestinal contents, takes place within the strangulated gut. The resulting augmentation of bulk tends at the same time to prevent its untwisting by wedging the volvulus more tightly among the surrounding organs, and to tighten the constriction by traction in the direct line of the twist.

The kidneys were normal in size and structure, but showed intense congestion, the blood dripping freely from them in section. The ureters were not compressed, and there was no hydronephrosis. The bladder was empty.

No other organs were examined.

The symptoms in the foregoing case, taken together, form a typical description of acute strangulation of the gut high up. There was nothing wanting. The sudden onset; the free and repeated vomiting; the pain referred at first to the umbilicus, and tenderness in that region; colicky paroxysms from the vermicular motion of the unimprisoned bowel; the oliguria amounting to almost total suppression; the vesical and rectal tenesmus; the rapidly on-coming shock, which deepened from hour to hour, make up a clinical record not difficult to decipher. The absence of any previous illness, of external hernia, of any tumour or area of abnormal percussion dulness in the line of the colon or elsewhere in the abdomen, seemed to exclude a large group of the anatomical causes of the strangulation. There remained, however, as possible causes of the formidable array of symptoms presented by my patient, strangulation by the omentum, by diverticles from the intestine, by the appendix vermiformis, strangulation in holes and fissures of the mesentery, in openings abnormally present in different organs, the knotting of loops of bowel, kinking of the bowel, internal hernias, and torsion or twisting, all of which have been found, in varying frequency, to be the cause of acute intestinal obstruction. The difficulties in the way of a differential diagnosis between these conditions during life, without an operation, are in the present state of our knowledge insurmountable. With the experience derived from a very careful study of the case, as compared with numerous recorded cases, I am disposed to regard two symptoms present in it as of value as pointing to torsion. Of these the first is a subjective one, that of the marked sensation of a cord drawn tight inside the belly; the second is objective, the oval symmetrical protuberant distension in the hypogastrium, forming a circumscribed bulging in an abdomen elsewhere moderately tympanitic.

The last was of short duration, disappearing as the meteorism became more marked and general.

With reference to treatment, the question that the physician, face to face with a case of acute intestinal occlusion, must ask himself, is, whether a spontaneous cure is possible, or the abdomen must be laid open and the block relieved by direct mechanical means in order to avert death. As he considers the answer, it is not to be forgotten that the fatal termination may be near at hand. In cases of strangulation by twists it has taken place within twenty-four hours, while the average duration is four days. And the average duration of acute occlusion from all causes is set down by Leichtenstern<sup>1</sup> at six days, the range being between eight hours and thirteen days. Whilst there may be time for deliberation, for the most critical study of the case, for the treatment of shock and of the inflammation by which death is brought about, there may on the contrary be no moment to spare; the only hope for the unhappy patient may lie in the prompt resort to the operation of laparotomy. The measure of the immediate danger is the intensity and continuance of the shock. Collapse, deepening from bad to worse, until it becomes profound, as was seen in this case, in which death occurred from cerebral anæmia in the thirty-second hour, calls for immediate operative interference. It is at once indicative of the extent of the injury and the intensity of the force producing it. Here the intestine to the length of five feet was cut off from the circulation, and by a twist almost as hard as a hempen cord and not thicker than one's little finger. The result was not due to the obstruction of the bowel, nor to the enteritis which followed; it was due to shock. Such was the condition of the bowel, that had the strangulation been relieved the morning of the day of the patient's death, recovery could scarcely have occurred. Yet the previous evening he was walking restlessly about the house, having been well twelve hours before, and suffering from what he regarded as a troublesome attack of "colic." The indications for treatment were clearly the relief of pain by opium and belladonna, the administration of stimulants, the use of artificial heat, rest in the most comfortable posture. The uselessness and the danger of forcible enemata are pointed out by Dr. Allbutt in a recent paper.<sup>2</sup> The number of spontaneous cures that have occurred after the gravest symptoms of intestinal occlusion, such as stercoraceous vomiting and the like, though not great, is so considerable, that to have resorted to laparotomy to make reparation of a bowel misplaced in a way unknown, would have been at that time, although the only treatment as the event proved at all likely to be successful, an undertaking not less heroic than the use of the drastic purgatives, in vogue as recently as the days of Trousseau.

<sup>1</sup> Loc. cit.

<sup>2</sup> British Medical Journal, Jan. 11, 1879.

## ARTICLE V.

DEFORMITY OF SHOULDER FOLLOWING NERVE INJURY. By L. McLANE TIFFANY, M.D., Professor of Operative Surgery in the University of Maryland.

WHILE injury to the posterior circumflex nerve is recognized as a possible complication in dislocation at the shoulder, and as such is mentioned in the usual text-books, yet the signs of such an affection are perhaps capable of further translation. These signs are usually very plain, and demand early recognition, not only because a complete diagnosis is essential to the patient's welfare, but because an intelligent prognosis is essential to good surgery. The following, therefore, is offered as elucidating somewhat a condition of affairs rarely very obscure.

CASE I.—J. Q., aged 33 years, a strong, healthy sailor, slipped and fell on the deck of his vessel while attempting to grasp a rope. On rising, the left arm being useless, he descended to the cabin; there was then "a lump in front of the shoulder, and the bones on top stuck out" (his own words). He was laid on the floor by four shipmates, who pulled upon his arm with all their force; after a while the "lump went away." Since the fall he has been unable to perform seaman's duty, for he cannot raise the elbow from the side. Twenty-four days after injury, his condition is thus described: the affected arm hangs easily, the elbow touching the side; the hand can be placed upon the opposite shoulder; the shoulder has lost the normal contour, being somewhat flattened; there is a depression beneath the acromion, the deltoid muscle feels more soft than natural. Measurement shows the circumference of the deltoid to be half an inch less on the affected than on the well side; from the acromion to the external epicondyle is, on the affected side, three-quarters of an inch longer than on the well side. There is a fulness over the anterior aspect of the joint. By pressing the elbow upwards towards the socket, the head of the humerus returns to the normal position, the contour of the shoulder is restored, and the distance between the acromion and epicondyle equals that between the same points on the other side of the body. The interrupted current produces no contraction of the deltoid. Commencing one and a quarter inch below the acromion over the deltoid is an area of cutaneous anaesthesia seven inches long by two and three-quarters inches broad, of irregular outline, the long diameter corresponding to that of the arm, the apex situated at the humeral attachment of the deltoid. This anaesthetic territory is surrounded by a zone one-third of an inch broad, of intense hyperaesthesia, which gradually fades into normal sensibility.

Immediately after the accident J. Q. suffered from loss of power, together with pain in the thumb, index, and middle fingers of the left hand; this, however, passed off in a week, leaving no ill effects. At present the fingers are in all respects normal.

While passive motion of the joint can be made to nearly the normal extent unaided, motion is greatly limited; thus directly forwards, the elbow being straight, the arm can be elevated only to an angle of  $45^{\circ}$  with the vertical, showing implication of anterior deltoid fibres. On attempting to carry the hand to the mouth, the elbow is sharply flexed, and



the forearm then slid along the front of the chest, the head is strongly inclined, and sometimes the finger tips touch the mouth, sometimes not. Elevation of the arm directly outwards from the side is impossible, implication of middle deltoid fibres; so also elevation of arm outwards and backwards is impossible, implication of posterior deltoid fibres. The loss of motion in these two last directions largely restricts the usefulness of the hand; thus he is unable to touch his back above the buttocks, the side above the ilium, and places the hand in his pocket with difficulty and very slowly, the member being in strong pronation. When attempts are made to use the arm, the trapezius and great pectoral muscles are brought into strong action, so as to move the entire shoulder, and thus compensate for the deltoid insufficiency. Rotation of the humerus outwards, supination, is weaker than in the opposite arm, implication of *teres minor*(?).

The above history points to a lesion of the posterior circumflex nerve, which, taking its origin from the posterior cord of the brachial plexus, winds around the surgical neck of the humerus to be distributed to the deltoid muscle and skin over it, the *teres minor*, and shoulder-joint. The impaired use of deltoid, cutaneous anæsthesia and diminished supination from supposed *teres* paralysis all conform strictly to the anatomical relations of the nerve in question, and were confirmation required, it would be found in the temporary pain and loss of power experienced by the patient in the thumb, index and middle fingers, parts supplied by the radial nerve, the proper continuation of the posterior cord.

A certain roughness of the joint was present when J. Q. was first seen, but it would be useless to speculate as to whether such a condition were due to nerve injury or the direct violence of luxation.

Taking the patient's description of the accident, it is fair to suppose that he sustained a dislocation of the left humerus, subcoracoid, and inasmuch as the head of the bone was promptly replaced by strong traction, the question at once presents itself, was the nerve lesion produced by dislocation, or by the violence exerted in effecting reduction? While it is not to be denied that strong and prolonged traction might injure the circumflex nerve, yet it does not seem likely that forcible reduction of a luxation would cause greater injury than the violence which caused the displacement; nor is it necessary that the nerve lesion should be preceded by a luxation, for simply stretching or jarring a nerve may seriously impair its action,—just as stretching a nerve may so modify its nutrition as to cure a persistent neuralgia.

Of such an injury to the posterior circumflex without dislocation of humerus the following is an example:—

CASE II.—A. B., white, a strong, healthy man, while driving a carriage was thrown from his seat, striking the ground on his left shoulder. He was seen shortly afterwards by a physician, who pronounced his injury a bruise, recommending rest for a few days, and subsequently a stimulating liniment. When seen by me, three months later, drooping of the shoulder, inability to raise the arm outwards from the side, flabbiness of the deltoid, and fulness over the anterior aspect of the joint were all present. Questioning

elicited no history of cutaneous anæsthesia, nor was it present at the time of my examination.

In this case there was present deltoid paralysis, yet no dislocation at the shoulder had occurred, nor had the patient been subjected to violent manipulation of the affected limb in attempted reduction. It is fair to presume that the posterior circumflex nerve was injured by the shock of the contusion, or else that the humeral head was thrust partly from the socket so as to injure the nerve, returning to the glenoid cavity when violence ceased, a not very likely hypothesis. This patient was seen but once, so the progress of the case is unknown.

J. Q., however, remains under observation, receives in the way of treatment the constant current, and is slowly regaining the use of the arm, while the cutaneous sensibility is increasing. It is a noteworthy fact that improvement did not commence until more than two months after the accident, which would suggest a guarded prognosis in cases of similar nature. The prognosis in regard to complete recovery is a question of vital importance, as also the probable duration of impaired nerve function. In a certain number of cases the paralysis is permanent. In *Cooper's Surg. Dict.*, vol. i. p. 527, Desault is credited with two cases of complete paralysis, one permanent, the other disappearing in fifteen days; Boyer with three cases of deltoid paralysis, one being permanent; Nelaton with one which disappeared in ten days. Inasmuch as there does not appear to be any very certain method of distinguishing between a nerve strained, or completely torn across, at once, it is not possible to express an opinion in respect to entire recovery when the patient is first seen.

The appearance presented by a shoulder affected in the manner stated is very suggestive of partial dislocation, were such a condition of affairs possible, and might give rise to the idea, if seen some time after the receipt of the injury, that a dislocation had occurred, and had not been reduced. The fulness which is apparent at the anterior aspect of the joint I ascribe to the lax condition of the deltoid, which permits the head of the humerus to slip downwards until the convexity rests upon the prominent lower rim of the glenoid cavity; the recumbent position, or pressing the elbow upwards, both cause the fulness to disappear. I would suggest as a possible hypothesis that the teres paralysis permits the head of the humerus to fall forwards towards the anterior edge of the socket.

At present, four months after the receipt of the injury, cutaneous sensibility is restored, hyperæsthesia is present only at the posterior edge of the deltoid above the axilla. Paralysis of the anterior deltoid fibres has greatly improved, of the middle fibres less, of the posterior fibres least; depression below acromion still marked; patient can pass left hand over his whole scalp, can touch back above buttocks, and continues to improve slowly. The anterior prominence over joint remains, as also a corresponding depression beneath the acromion behind; some slight roughness of the socket is present; pressing the elbow upwards, and the anterior projection

backwards restores the normal contour of the parts; this, however, is much more difficult than formerly, and may ultimately result in permanent so-called partial dislocation.

Practically, the early recognition of the trouble in question is of prime importance, since the prognosis of a dislocation will vary greatly according as nerve injury be or be not present. It is, and for some time has been, my custom, within a week after the receipt of an injury to the shoulder to remove all bandages, and cause the patient to execute such motions as necessitate the use of different portions of the deltoid muscle, the better to corroborate my diagnosis; for a patient will receive, shortly after an accident, an unfavourable opinion with a certain amount of equanimity, while the same opinion delivered two months later for the first time, will subject the surgeon to much possible criticism as to "why he did not find out sooner what was the matter?" All the more advisable is it in view of Case 2 to examine for paralysis when there has been no dislocation.

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#### ARTICLE VI.

ON ABDOMINAL DRAINAGE OF ADHERENT PORTIONS OF OVARIAN CYSTS AS A SUBSTITUTE FOR COMPLETED OVARIOTOMY. By LEWIS A. STIMSON, M.D., Surgeon to the Presbyterian Hospital, New York.

A FEW weeks ago it was my fortune to witness an operation undertaken for the removal of an ovarian cyst by one of our most experienced and skilful gynæcologists, to be present at the death of the patient four hours afterwards, and to share in the grief caused by the loss of one whose life had been spent in unselfish devotion to others and whose watchfulness kept want and care from many sick and feeble.

Death, in all its forms, is only too familiar to the physician, but when it follows with brutal haste upon an attempt to relieve, undertaken confidently after mature deliberation, guided by full knowledge and experience, and executed with precision and skill, it forces upon us a crushing sense of responsibility and renews the conviction that our art may sometimes be more potent for harm than for good. If a rule of conduct is to be drawn anew from that sense and that conviction, it is not that we must refuse to interfere, but that we must learn from our reverses, enlarge our knowledge, and improve our methods. The maxim that our first duty is to do no harm—*primum non nocere*—is not intended to reduce us to the rank of simple spectators; it is to stimulate us to attain greater accuracy in diagnosis, greater skill in treatment, and quicker perception of indications. In the hope of furthering those objects I have ventured to follow out some lines of thought suggested by this case, which presented some of the most serious complications of ovariectomy.

The patient, 38 years of age, had an ovarian tumour which had grown in four years from the size of a duck's egg to that of a three months gravid uterus. She had suffered much from peritonitic and uterine trouble, and five weeks before the operation had a sharp, though short, attack of peritonitis which was followed by rapid increase of the cyst and by a low fever, which confined her to the bed for four weeks. The fifth week was spent in an attempt to improve her general condition, but, as the tumour continued to increase and the distress was great, further delay was considered unjustifiable, and the patient was placed upon the table eager for the operation and happy in the hope of a permanent and complete cure. When the peritoneum was reached it was found thickened and vascular and closely adherent to the sac. The adhesions, which occupied an area extending to the umbilicus above and to a distance of three inches on each side of the incision, were torn with the fingers and steel sound. In accomplishing this the sac was ruptured and was then emptied of its thin purulent contents by turning the patient upon her side. The sac, which had a capacity of about three quarts, was forcibly separated from some adherent intestinal loops and partially removed, its deeper portion being treated as a pedicle and fastened into the abdominal wound by transfixion with three of the silver sutures used to close that wound after the peritoneal cavity had been cleaned. The entire operation, including the dressing, occupied about three-quarters of an hour, and at its close the operator expressed the opinion that peritonitis would certainly supervene and prove fatal. The patient was taken from the table pulseless and remained so until her death, four hours afterwards.

The fatal issue was, of course, the result of shock ; but, leaving aside that point for the moment, let us consider the facts which were the basis of the grave prognosis given at the close of the operation, that of a probably fatal peritonitis, a prognosis amply justified by recorded experience.

These facts, exclusive of those belonging equally to every ovariectomy, were the existence of extensive adhesions and the purulent character of the contents of the sac. The latter was more than suspected before the operation was proposed, and its principal importance seems to lie not in itself but in its consequences antecedent to removal ; that is, in the deterioration of the general condition of the patient and in the adhesions to which the inflammatory process, associated with the suppuration, gives rise. In itself, suppuration of the sac is not a cause of peritonitis after an operation, unless the pus should escape into the peritoneal cavity and not be entirely removed therefrom. In this case the pus did not come into contact with the peritoneum, and the source of the danger must therefore be sought in the adhesions.

All authorities agree in considering the existence of adhesions a complication, the gravity of which varies directly with their number, extent, and solidity, because of the danger that their rupture may excite peritonitis, or that the bleeding from their torn vessels may lead to septicæmia. The danger lies not in the existence of the adhesions, not in the antecedent inflammation or irritation that has caused them, but in their rupture, in the possible spread of the new inflammatory process set up by the

local injury. Indeed, many surgeons consider that the processes which produce the adhesions modify at the same time the remaining surface of the peritoneum and render it less liable to take on acute inflammation, so that if it were not necessary to separate the surfaces thus adventitiously united the danger of ovariectomy would be less when adhesions exist than when they do not. Dr. Peaslee<sup>1</sup> quotes in this connection Dr. J. Clay's statistics showing that the mortality when there were no adhesions was 30 per cent., when there were slight adhesions 40 per cent., extensive adhesions 50 per cent., and extensive adhesions requiring ligatures 70 per cent. Kœberlé's statistics, quoted also by Peaslee, give a mortality of 15 per cent. when there were no adhesions, 19.8 per cent. with slight adhesions, and 45.5 per cent. with grave adhesions. It is not easy to accurately tabulate reported cases with reference to this point because of the insufficiency of detail concerning the extent and character of the adhesions, but I have tried to draw some conclusions from the three hundred cases of ovariectomy reported by Mr. Spencer Wells in Vol. lx of the *Medico-Chirurgical Transactions*, 1877.<sup>2</sup> These are the three hundred following his first five hundred cases. The rate of mortality in cases in which the presence of adhesions of any character is noted is more than one-half larger than in those cases in which there were no adhesions, and this increase is due to peritonitis, septicæmia, or exhaustion; in other words, to conditions originating in the greater violence inflicted upon the patient. Many of the adhesions must have been of the kind described by Dr. Peaslee as "physiological," in distinction from "pathological;" that is, slight non-vascular adhesions due to prolonged contact of two surfaces without inflammation. As their rupture involves no bleeding or violence, their rate of mortality is probably nearly as low as that of uncomplicated cases, and therefore the rate of mortality of the tougher "pathological" adhesions would be correspondingly higher than the average, 30.8 per cent., of the two combined. Upon this point, unfortunately, we can get no positive information from the statistics. The adhesions in Mr. Wells's table are described simply as "parietal," "intestinal," "omental," "pelvic," etc., and, if we assume that in the cases in which two or more of these terms are used together the adhesions were tougher and more extensive than in those in which only one term is used, we have 76 cases of compound adhesions furnishing 28 deaths, a mortality of 36.8 per cent.; and if we take 3 cases in this table in which the adhesions were certainly very extensive and strong, we have a mortality of 66.66 per cent.; or,

<sup>1</sup> Ovarian Tumours, p. 377.

	No. of cases.	Deaths from septicæmia, peritonitis, or exhaustion.	Deaths from other causes.	Total deaths
No adhesions . . .	128	18 = 14 per cent.	6	24 = 18.7 per cent.
Adhesions . . .	172	47 = 27.3 "	6	53 = 30.8 "
	300			77 = 25.66 per cent.

adding to them 3 similar cases that have come under my own observation, 6 cases with 5 deaths.

It is unnecessary to dwell longer upon this point. The danger of tearing firm adhesions is thoroughly understood, and the writers upon ovariectomy, appreciating this danger, have even declared distinctly and repeatedly that, as no man can surely foresee the condition of the sac and its relations with the wall and viscera, the abdominal incision must always be regarded at first as merely an exploratory one, to be merged afterwards into an ovariectomy if the conditions disclosed by it justify that operation. This is sound advice, but it does not seem to be often embodied in practice, if we can judge from the scantiness of the records of abandoned operations. The reasons are not obscure. No rule of practice has been laid down for guidance in these cases except in vague and general terms. We are told that if the adhesions are "too extensive" the removal must not be attempted; but how is the operator to know whether they are or are not "too extensive"? He may learn of the presence of the deeper ones only after he has torn those which lie near his incision, and then comes the natural reflection that he has already gone too far to turn back. *On ne va jamais si loin que quand on ne sait où l'on va.* No one likes to abandon an attempt, to confess his powerlessness; and there are enough instances of rare success under unfavourable conditions to encourage an operator to persevere when once fairly committed to the attempt; false beacons that serve to wreck and not to save. If the case does well, the surgeon congratulates himself; if it does ill, he consoles himself with the thought that the fatal issue was inevitable. Moreover, he seems to have no alternative. He must either give the patient the slight chance which the completion of the removal offers, or he must abandon her to her fate. But is that the only alternative, and is that abandonment as hopeless as it sounds? Mr. Wells's experience casts a light, even if a feeble one, upon this question. In the seven years following 1865 he abandoned the operation or left it incomplete 19 times for various reasons.<sup>1</sup>

In 3 of the cases the cyst was tapped and the abdominal wound closed; the recorded result is "relieved as after simple tapping."

In 7 cases of partial removal all died.

In 2 cases, one of ruptured cyst and adherent dendritic tumour, the other of adherent papilloma of both ovaries, the interference was restricted to cleaning the peritoneal cavity; the patients recovered.

In 1 case of ruptured cyst, with cancerous nodules all over the peritoneum, the liquid was removed from the peritoneal cavity, and the patient died on the 30th day.

In 6 cases he emptied the cyst and fixed it to the edges of the abdominal

<sup>1</sup> Table quoted by Peaslee, loc. cit. p. 393.

incision in such a manner that its permanent drainage was assured; 2 of these 6 died, on the 4th and 20th days.

If we group these nineteen cases in three classes of (1) abandonment, (2) partial removal, and (3) substitution of drainage for ovariectomy, we have six cases of abandonment, of which only one, and that a case of generalized cancer, died; the others were "relieved," and of one of them it is said that she was improving in health and strength five months afterwards.

Even if we admit that this relief was only temporary, and that all succumbed ultimately to the progress of the disease, this result is much to be preferred to that of the second class, which gives seven cases of partial removal with seven deaths.

The third class contains six cases in which the adhesions were left untouched, and the sac treated by permanent drainage through the abdominal incision; of these, two died and four were *cured* (not merely relieved), a mortality of 33.3 per cent., which is less than that, 36.8 per cent., of the completed operation in the 76 cases of compound adhesions mentioned above.

It is usual to speak of permanent drainage of an ovarian cyst as a very fatal procedure, and, so far as I have been able to learn, it is rarely resorted to; but Dr. Thomas<sup>1</sup> says of it that a certain class of cases can be treated in no other way, and that "it offers a chance of permanent cure almost equal in proportion to two out of three," an estimate which corresponds exactly with that just drawn from Mr. Wells's statistics. He also gives<sup>2</sup> Scanzoni's record of fourteen cases of drainage through the vagina, of which eight were cured, two relapsed in a few weeks, three were lost sight of, and one died of typhoid fever two months after the operation. Dr. Peaslee<sup>3</sup> furnishes similar testimony; he quotes six cases treated by Dr. Noeggerath by permanent drainage through the vagina, with five cures and one death, and says "I regard this operation (Dr. Noeggerath's) as being of the highest value in those cases of ovarian cysts to which, on account especially of adhesions, ovariectomy is not applicable." It does not appear in his analysis why this operation is not equally applicable to many other less complicated cases, for its mortality, 16.66 per cent., is less than that, 18.7 per cent., of ovariectomy even under the most favourable conditions, and there is nothing to indicate that the survivors were not completely cured. Apparently the subsequent record of this operation has not been so favourable, for Dr. Thomas, writing four years later, says Dr. Noeggerath's "success has not been encouraging thus far, but he is favourably impressed in regard to the plan, and attributes his unfavourable results to the fact that the cases upon which he has operated have most of them been complicated by malignant or other serious disease."

<sup>1</sup> Dis. of Women, pp. 712 and 713, 4th edition, 1876.

<sup>2</sup> Loc. cit. p. 708.

<sup>3</sup> Loc. cit. p. 221.

The reason for the preference of ovariectomy is possibly more moral than surgical, and in a measure the unconscious outcome of natural impulses in the mind of the surgeon rather than of the indications furnished by the disease. The career of ovariectomy has been so rapid and brilliant, its results have been so favourable when compared with those of previous non-interference, and the stimulus to seek a share in the fresh triumph is so great, that it is only natural for a surgeon to perform the operation when the opportunity presents itself, and to be satisfied that he has done his duty by his patients if his rate of mortality does not exceed the recorded average which he is only too willing to accept as the measure of the inevitable results of causes inherent in the disease or operation and beyond his control.

Meanwhile nothing is done to diminish this average. Dr. Thomas<sup>1</sup> has pointed out very forcibly the advantages which experience gives in this operation, but Mr. Wells's last 300 cases show a higher rate of mortality than the preceding 300. He explains<sup>2</sup> this on the theory that the practice of ovariectomy having become more general, he receives from other practitioners a larger proportion of the more unfavourable cases and a less proportion of the simple ones, and also because he has substituted simple tapping for ovariectomy in many simple uncomplicated cysts; and, finally, because, encouraged by some unexpected successes, he has accepted the slight chance offered by an operation in some cases which he would formerly have considered absolutely hopeless. There is reason to think that these influences would be fully compensated for by the fact that his success and increasing reputation would tend each year to bring cases to him at an earlier period in their course, and therefore enable him to select his time and operate with a greater chance of success. His statistics do not give sufficient details to enable us to determine the character of the complications, but if we arrange the successive hundreds according to the existence or non-existence of adhesions, we have the following table:—

	NO ADHESIONS.			ADHESIONS.			
	Cases.	Deaths	Mortality.	Cases.	Deaths	Mortality.	Total.
1st 100	36	13	36.1 per cent.	64	21	32.8 per cent.	34
2d 100	34	4	11.7 "	65	23 <sup>3</sup>	35.3 "	27
3d 100	34	6	17.6 "	66	16	24.2 "	22
4th 100	41	6	14.6 "	59	16	26.9 "	22
5th 100	43	8	18.6 "	57	11	19.3 "	19
6th 100	7	13	27.6 "	53	16	30.1 "	29
7th 100	41	6	14.6 "	59	18	30.5 "	24
8th 100	40	5	12.5 "	60	19	31.6 "	24

<sup>1</sup> Loc. cit. p. 740.<sup>2</sup> Medico-Chirurgical Trans., vol. lx., 1877.<sup>3</sup> Exclusive of a case in which death, attributed to "cancer," occurred six weeks after the operation.



which, if it can be relied upon to show anything, shows that the number of complicated cases in the last 300 is 172 as against 182 in the 300 just preceding, and that the fatal cases among these were respectively 53 and 43. Even if we accept his first and third reasons as a sufficient explanation of this increase, we cannot admit that there is anything in the record to show that his experience had enabled him to obtain a greater degree of success in the treatment of adhesions at the termination of his active career as an ovariologist than shortly after its beginning.

Dr. Peaslee<sup>1</sup> writing in 1872 says: "the great desideratum, therefore, at present is an improved method of treating them" [adhesions]. But that improvement has not come. We possessed then all the means we possess now: ligature, cautery, styptics, acupuncture; and Mr. Wells's 300 operations performed since that date show a greater mortality in this class than the preceding 300. It is not probable that any man will operate more frequently than Mr. Wells has done, and even if one should do so it is not to be expected that even a hundred additional operations would teach him anything that he has failed to learn from eight hundred. The conclusion then seems to be unavoidable that ovariectomy must be fatal in about one out of every three cases complicated by adhesions, if those adhesions are torn and treated by the means now at our disposal. This is a very serious mortality and, as I have already pointed out, is not materially less than that on which Dr. Thomas<sup>2</sup> characterizes drainage of the sac as too dangerous ever to become popular.

It is true that much better results have been obtained by Dr. Keith, of Edinburgh, and by Mr. Thornton, the pupil and successor of Mr. Wells at the Samaritan Hospital, and that under the impulse given especially by the former the complete Lister method has been adopted in the last four months by ovariologists with an enthusiasm that recalls its adoption by general surgeons a few years ago. Dr. Keith's statistics, published in the *British Medical Journal* for January 5, 1878, show a most remarkable success, and one that has increased regularly with each succeeding set of 50 cases, the mortality of the first 50 being 11, that of the fifth 50 only 4. In seven years he has not lost a single case of simple ovariectomy uncomplicated by adhesions, and his record is all the more remarkable for the fact that the presence of adhesions is noted in a much larger percentage of cases than in Mr. Wells's statistics. This success was obtained practically without the Lister method, for this method was used in only 21 of his last set of 50 cases, and of these 2 died, so that his estimate of its value is rather in the nature of a prophecy than of a deduction from experience. Moreover, in a later article (*Ibid.*, October 19, 1878), in which he gives a table of 49 cases treated antiseptically with only 2 deaths, he says "the mortality of ovariectomy has with me got less and less every year

<sup>1</sup> Loc. cit., p. 303.

<sup>2</sup> Loc. cit., p. 712.

since I began it, till in the year before antiseptics it had fallen to 5 per cent.," a percentage which is only 1 greater than that obtained afterwards by the use of antiseptics. He attributes his success to drainage by large glass tubes, cauterization of the pedicle (for which however he substituted the clamp in 40 of the fifth 50 cases), the use of compression-forceps to prevent loss of blood, and to the use of ether instead of chloroform. All of these measures are and have been in use by other surgeons, and yet the general results, so far as can be judged in the absence of statistics, are far below Dr. Keith's. It seems probable that his success is a personal one, one due to the man rather than to the method, the result of a devotion and enthusiasm which are indicated in the fact that most of his cases were treated in a private hospital established by him and maintained mainly at his own expense.

I am a thorough believer in the value of the complete Lister method, but I do not think the propriety of depending upon it in all cases of ovariectomy is yet established; and there are reasons for thinking that the prolonged exposure of the peritoneum to the carbolyzed spray and the carbolic solution may have consequences as serious as the septicæmia which may thereby be averted. Mr. Lister himself, in commenting on Dr. Keith's last paper (*Brit. Med. Journ.*, Nov. 1878, p. 733), confines himself to the cautious statement that while he had formerly advised against the use of his method in ovariectomy, through fear of the irritation of the peritoneum, he now expected greater safety in small operations from the use of the spray. Any one who has experienced the irritating effect of the spray upon his own hands may well dread its influence upon the more sensitive peritoneum, and when we remember that simple washing of the body with the carbolic solution for the cure of scabies has caused death three times by carbolic poisoning (*Von Langenbeck's Archiv*, vol. xxiii), we may well hesitate to incur the risk of the same absorption by the much more actively absorbent peritoneum.

A striking proof that the Lister method is not in itself sufficient to produce exceptionally excellent results is shown incidentally in Dr. Keith's last article, by the statistics of four German ovariectomists, who lost 33 out of 155 cases treated antiseptically, a mortality of over 21 per cent.

Let me now repeat the somewhat scanty statistics of drainage as an introduction to the question of the propriety of systematizing it and substituting it for ovariectomy when the sac is adherent. Mr. Wells drained the sac in 6 cases, after having found the adhesions too firm to admit of removal; of these 2 died, one on the 4th, the other on the 20th day. Dr. Noeggerath established permanent drainage through the vagina 6 times, with 5 cures and 1 death. Scanzoni did the same 11 times without a death, and 3 times without known result. Dr. Thomas gives a table of 33 cases of drainage through the abdominal wall with 12 deaths (36.3 per cent.), but he offers it only as an imperfect report on account of the difficulty of dis-

tinguishing between drainage and simple tapping, and he adds, "In some cases the entire sac was filled with pledgets of lint saturated with caustic solutions; in some, threads of worsted or other substances were rolled into balls, dropped into the sac, and the ends allowed to hang out of the incision," measures which certainly were not likely to diminish the danger of the operation, and, if used at all, should have been reserved until the sac had contracted.

The mortality of Mr. Wells's cases may be safely taken as the maximum, because the adhesions, being of the firmest and most extensive kind, must have opposed the contraction of the sac and prolonged the period of suppuration, and because drainage was undertaken only after the abdominal cavity had been exposed to the air, and its contents manipulated. The cases combine therefore the dangers of laparotomy associated with exploration and possible rupture of the adhesions first encountered, and those peculiar to prolonged drainage. It is not unlikely that in the case which died on the 4th day the fatal issue was due to the exploration and not to the drainage, and that if the sac had been drawn immediately into the abdominal incision, stitched fast there, and then drained, the result would have been different. I have but little hesitation in expressing the opinion that a sac adherent to the abdominal wall on each side of the incision could be safely treated in the great majority of cases by simple incision and drainage, especially under antiseptic rules, for such a method would involve no injury to, or exposure of, the peritoneum, and the sac would shrink and close like an ordinary abscess. I believe also that a cyst not adherent at this point could be drawn into the incision as soon as it presents, fixed there, opened and emptied, its character and relations with the viscera satisfactorily determined by the hand introduced into its cavity, and then treated either by ovariectomy or by drainage, according to the light furnished by that examination, with a larger measure of success than is now the rule; for the exploration would not increase the danger of the operation in the cases in which ovariectomy should be afterwards resorted to, and it would prevent its performance in those cases which now give it the highest rate of mortality, and substitute for it a much less fatal method.

This is not a proposal to substitute drainage for ovariectomy in all cases. It is only an amplification of the principle laid down by all writers that the abdominal incision must be made as an exploratory one; it is an attempt to insure the making of that exploration, and a proposal to substitute exploration from within the sac for exploration outside of it; and, finally, to restrict ovariectomy to the simpler cases, and substitute drainage for it in the complicated ones.

If the surgeon's first act is to break up firm vascular adhesions it cannot be properly called an exploration, and yet the cases in which this is done are the very ones in which a real exploration is most necessary. In many cases, especially of single cysts, it must be possible to learn all that needs

to be known of the character and relations of the tumour from within the sac. Dr. Thomas<sup>1</sup> says of Simon's method of exploration through the rectum that "by it the examiner is enabled to hold the ovaries between the thumb and finger and appreciate their size, consistence, and smoothness; to discover tumours of the uterus no larger than a cherry; to ascertain the length of the pedicle of an ovarian cyst, and the freedom from attachments of the cyst itself." What is possible to his skilled touch acting under such unfavourable conditions must be within the power of any hand moving within a sac whose cavity is so much larger and whose walls are usually no thicker than those of the rectum. Even if this exploration should require more time than is usually given to this stage of the operation the patient is not harmed by the delay, for the sac fills the incision completely, and the peritoneum is not exposed to the air. Any such delay would be fully compensated for afterwards, for no time would need to be spent in arresting bleeding from torn adhesions or in cleaning the peritoneum, and the two principal causes of peritonitis and septicæmia would be avoided, for the peritoneum would be subjected to no violence, and no blood would escape into its cavity.

The operative procedure would be:—

1. Incision of the abdominal wall in the usual manner.
  2. Introduction of a trocar, removal of enough of the contents of the sac to allow it to be drawn into the incision and fixed there by two long pins passed through it at the level of the upper and lower ends of the incision and resting transversely upon the skin.
  3. Incision of the sac between the pins, and removal of its remaining contents.
  4. Introduction of the hand into the sac, and determination of the presence or absence of adhesions. If adhesions to the movable viscera cannot be recognized positively in this manner, they can be *de visu* by drawing the sac partially out through the incision until the adhesions come into view, or by the conjoined use of the steel sound in the usual manner.
  5. If no adhesions exist a complete ovariectomy is made; if adhesions of any strength exist the free portion of the sac is excised, and the edge of the remainder stitched to a portion of the sides of the abdominal incision so as to leave this portion of the sac in the shape of a pouch with an open mouth through which one or more drainage tubes are introduced; the remainder of the abdominal incision is closed in the usual manner.
- If adhesions exist at widely distant points the intermediate portion of the sac is withdrawn and excised, thus leaving two or more separate pouches instead of a single one. If the sac is firmly adherent along the line of the abdominal incision, advantage should be taken of the fact to complete the operation without opening the peritoneal cavity by pinching

<sup>1</sup> Loc. cit. p. 65.

up the non-adherent portions and inverting them, if possible, through the incision.

In multilocular cysts each successive sac may be broken into and emptied through the first, as Mr. Wells recommends for tapping during an ovariectomy, and as Dr. Thomas<sup>1</sup> practised in a case his treatment of which combines most of the procedures I have here urged. This case, in fact, is such a notable example of the value and innocuity of these procedures (although Dr. Thomas drew a different inference) that I cannot do better than quote it in their support, and, with all deference, appeal from his judgment of 1875 to his judgment of 1879. He says:—

“I made an abdominal incision, to remove a cyst, and upon tapping found its contents so thick and contained in so many sacs, that I had to incise the main sac and introduce my hand to empty them. The tumour was found so firmly adherent to the liver, large intestines, and parts adjacent to the large blood-vessels on the spine, that its removal was entirely impossible. I therefore evacuated all the cysts, sewed the cyst-walls to those of the abdomen, closed the abdominal wound in part, and afterwards used antiseptic injections and drainage. The patient died on the twenty-first day, of pneumonia. Had I not done this, what other resource would have been open to me by which to give the patient even the smallest chance for life?”

He could scarcely have done better under any circumstances, for he practically saved his patient's life, and the case deserves to be placed with the four successful ones under somewhat similar conditions, quoted above from Mr. Wells's table of incomplected or abandoned ovariectomies. He secured his patient from the three great dangers of shock, peritonitis, and septicæmia. The pneumonia which killed her might have followed any operation, or might even have been entirely independent of it. I do not see how any treatment could have been more in accordance with the best surgical principles, unless possibly in the one detail of discovering the adhesions from within the sac, instead of from the outside, as I presume was done. He did no injury to the peritoneum, he caused no bleeding within its cavity, and he provided for a permanent cure by draining the sac and keeping it aseptic.

Such are the advantages of permanent drainage. What are its disadvantages? The objections urged against drainage through the vagina, notwithstanding its success, are not applicable to drainage through the abdominal wall, for they are objections of detail based upon operative difficulties which disappear in the presence of free access to the cyst. Kiwisch, quoted by Dr. Thomas, says of vaginal drainage: “In our opinion it is only of use in moderately large simple cysts, because in very large cysts the extensive decomposition must be very exhausting to the system, and compound cysts do not allow of a proper shrivelling of the open sac, as we experienced in a fatal case, in which two cysts were in juxtaposition, and only one could be punctured.” In operating through

<sup>1</sup> Loc. cit. p. 712.

the vagina the surgeon can do nothing but tap the portion of the tumour which presents, and he is helpless in the presence of multilocular or compound cysts; in operating through the abdomen the entire tumour is within his control, and if there are numerous cysts they can be successively emptied into the first, and the obstacle to the shrivelling of the sac removed. The drain of "extensive decomposition" is prevented by the excision of as much of the sac as can be drawn out through the wound, by more thorough drainage, and by antiseptics. The complete evacuation of the sac is followed immediately not only by collapse of its sides, but by a shrinking which greatly reduces its superficies, and if it is kept empty and unirritated by the products of putrefaction, the patient is exposed to absolutely no morbid influence except such as may arise from the primary incision. The results of the drainage, under antiseptic precautions, of large joints and cold abscesses in immediate proximity to the peritoneum, as well as elsewhere, are an assurance of the safety of similar drainage of an ovarian cyst, and the retardation of complete recovery by the persistence, for a longer or shorter time, of a fistulous opening, is a small price to pay for the greater freedom from risk.

I can foresee only two other possible difficulties. They are: (1) Hemorrhage into the sac from vessels of its wall, which have become distended in consequence of the withdrawal of pressure; (2) obstruction of the intestines by the establishment of fixed relations between them and the anterior abdominal wall. So few sacs are vascular, that hemorrhage is not likely to occur; and if it should take place it could be readily controlled, and, under antiseptic treatment, it would be free from its principal danger—that of absorption of the putrefied blood. Obstruction of the intestines would undoubtedly occur in a certain proportion of cases, but whether that proportion would be greater than under the present methods, experience alone can determine. That experience I cannot expect my own practice to furnish. If the facts here collected, and the arguments drawn from them, shall induce those whose opportunities are so much greater to give these suggestions a trial, my object will have been attained, and, I firmly believe, many lives will be saved thereby.

In conclusion, the different points I have sought to make may be formulated as follows:—

1. The mortality of ovariectomy, in cases complicated by adhesions, is at the rate of almost 1 death in every 3 such cases; and is about twice as great as the mortality in cases not thus complicated.

2. The principal causes of this mortality are shock, peritonitis, and septicæmia, and may be attributed, in most cases, directly to rupture of the adhesions.

3. This rate is not diminished by increased experience on the part of the operator, and there is no reason to expect that the methods now in use will ever yield a better result.

4. Permanent drainage of the sac offers a means of cure without rupture of the adhesions, and its mortality, when heretofore employed as a last resort in the so-called incomplected ovariectomies, has been 1 in 3 (Wells), or 1 in 6 (Péan).

5. The success of vaginal drainage proves that drainage of a sac is not in itself as dangerous as ovariectomy even under conditions most favourable to the latter.

6. Abdominal drainage has a much larger field of application than vaginal drainage, and is free from the principal dangers of, and objections to, the latter.

7. Adherent cysts, single or multilocular, should, therefore, be treated by permanent drainage through the abdominal wall, and not by ovariectomy.

8. Adherent cysts combined with solid tumours should, whenever possible, be treated by a combination of ovariectomy with drainage; the tumour being removed, and the adherent portion of the cyst being drained.

9. The character of a cyst, the presence or absence of adhesions, can be determined by examination by the hand introduced into the sac.

10. Therefore, the second step in every proposed ovariectomy should be to fix the cyst in the abdominal wound, open it, introduce the hand, and explore it from within. Upon the facts disclosed by that exploration the surgeon must decide whether to complete the ovariectomy or to substitute abdominal drainage. In cases in which this method of exploration is not effectual it must be supplemented by examination outside the sac, but this examination must be a real one, and not a successive rupture of adhesions as they are encountered.

11. Full antiseptic precautions must be taken during this exploration, and continued if drainage is established.

Since writing the above, I have examined, with reference to the results of partial removal of the sac and drainage of the remaining portion, Péan's statistics, published in his *Leçons de Clinique Chirurgicale*, Paris, 1876. These results are so notable a confirmation of the opinion expressed above concerning the value of this method, and are the outcome of so large an experience, that it has seemed best not to attempt to embody them in the text of the paper, but to add them as an appendix, in the hope that more direct attention may thus be drawn to them.

The statistics comprise 221 operations for the removal of tumours from the peritoneal cavity through an abdominal incision. Of these, 190 were ovariectomies (speaking broadly), and 25 were for the removal of fibromata or fibro-cystic tumours of the uterus. In 29 cases, where the sac was extensively adherent, or where there was no pedicle, the adherent portion of the sac, or the pouch left by enucleation (cases of cyst or tumour of the broad ligament), was fixed in the abdominal incision, and treated by permanent drainage.

Of these 29 cases 5 died, a mortality of only 17 per cent., the rest were cured, the fistulous opening persisting in some cases for months or even years; 14 were cysts of the broad ligament, and gave 11 recoveries and 3 deaths. Of the remaining 15, 12 of which were real ovarian cysts, 2 fibro-cystic tumours of the uterus, and 1 an hydatid cyst attached to the vesico-uterine cul-de-sac, 13 were cured and 2 died.

The details of the method employed by Péan may be gathered from the description of the treatment of the two fibro-cystic tumours of the uterus on page 703: "The non-adherent upper portion of the sac having been excised, the edge of the remainder, which formed a sort of purse, was sutured to the edges of the abdominal wound. The rest of the abdominal wound was closed in the usual manner, and two rubber tubes carried to the bottom of the sac to allow injections and the free escape of pus."

Such results as this should make a surgeon hope that, if he is to encounter any adhesions, they may be strong enough to forbid complete removal, and force him to employ drainage.

It is worthy of notice, too, that the cases which, in Péan's opinion, called for this modification of the operation were about 1 in 7 of all cases operated on.

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#### ARTICLE VII.

THE TOPICAL USES OF ERGOT. By WILLIAM C. DABNEY, M.D.,  
of Charlottesville, Virginia.

IN a recent number of the *Journal de Thérapeutique*, M. Planat, of Nice, called attention to the use of ergot in acute ophthalmia. No doubt other physicians have used this agent in affections of the conjunctiva and other mucous membranes, but it is surprising that medical literature should contain so little on the subject. I propose in the present paper to consider some of the topical uses of ergot and the circumstances under which it seems especially applicable.

The influence of ergot in causing contraction of the bloodvessels is too well known to need any comment, and I shall therefore say nothing as to its physiological action. M. Planat states that he has found ergotine to act equally well in acute and chronic ophthalmia. I have used it but little in cases of *acute* conjunctivitis, and was not altogether pleased with its action under such circumstances. It seemed to increase the irritation rather than to diminish it. In those cases, however, where the bloodvessels were enlarged and tortuous, excellent results were obtained. I recall very distinctly the case of a little girl about ten years of age who had been suffering for a week with conjunctivitis before I saw her. When she came to my office there was quite a free discharge of muco-pus from



the eyes, and the bloodvessels of the conjunctiva were considerably enlarged, the membrane itself being somewhat thickened and opaque. The eyes were not painful, and there was very little, if any, intolerance of light. The treatment directed was the frequent cleansing of the eye with warm water and the instillation after each washing of a few drops of the following solution: Ergot (solid extract), grs. x; glycerine, f ʒj; water, to make, f ʒj. M. There was a very manifest improvement in a few hours, and in three days the eyes were well.

When there is much intolerance of light, and the eyes are very painful, the results have been much less satisfactory. I have had no experience with ergot in cases of granular conjunctivitis, but it is probable that it would prove serviceable in such cases, and, indeed, I believe it has been tried with benefit. (As I am spending the winter at San Diego, California, for my health, I am cut off from my books and journals, and have not access to the literature of the subject.)

In cases of *pterygium* I have used it with decided benefit. A solution of the strength mentioned above was applied three times a day, and the growth was checked thereby. In none of the cases where I have used it thus far has it exerted a curative action, but it is highly probable that if persisted in the bloodvessels supplying the pterygium would become so much contracted as to cause an actual diminution in the size of the growth.

In *pharyngitis* I have obtained excellent results from the application of a solution of Squibb's solid extract of ergot to the throat; indeed, no other remedy has given anything like such satisfactory results in my hands. Just as in ophthalmia, the remedy seems to act much better in chronic than in acute cases. It is especially applicable when the bloodvessels of the pharynx are enlarged and tortuous, and when the secretion is not very great. In those cases where the mucous membrane is thickened, it acts much more slowly, and in acute cases it possesses no advantages over other remedies. In affections of the pharynx and in other cases to be mentioned hereafter a combination of ergotine with tincture of iodine, as in the following formula, is especially efficacious: Ergotine, grs. xx; tinct. iodine, f ʒj; glycerine, to make, f ʒj. M. To be applied to the pharynx freely twice a day with a camel's-hair brush.

In *hypertrophy* of the *tonsils*, which is so often an accompaniment of chronic pharyngitis, the same solution applied to the glands two or three times a day gives excellent results.

About two years ago a young lady of Brooklyn, New York, 15 years of age, who had been suffering for months with pharyngitis and enlargement of the tonsils came under my care. The mucous membrane of the pharynx and the soft palate was considerably thickened, and there was quite a free formation of thick yellow muco-purulent fluid. The tonsils were greatly hypertrophied. Her general health had suffered a good deal, and she had been taking tonics, but with very little benefit. Quinia, iron, and arsenic

were continued, however, and in addition her throat was brushed freely with the solution of ergot and iodine in glycerine twice a day. In two months' time her throat was well and her general health had greatly improved. In this case chlorate of potash, alum, zinc, and a solution of nitrate of silver had been faithfully tried before without benefit.

Within the past ten days I have had the same mixture applied to the throat of a gentleman whose pharynx was greatly congested and had been so for weeks. The bloodvessels were enlarged and tortuous, but there was very little secretion. The mixture was applied with a brush twice a day, and in four days the congestion had subsided almost entirely.

It is probable that nasal catarrh would be benefited by ergot, locally applied. The great trouble in these cases has been that remedies applied with the nasal douche have remained in contact with the congested Schneiderian membrane too short a time to do any good. About two years ago Dr. George Catti proposed the use of gelatine bougies, which were to be inserted through the anterior nares and then allowed to soften and flow out by the posterior nares. These bougies could be medicated with any agent which it was thought desirable to use, and in a note appended to the translation of Catti's paper in the *Virginia Medical Monthly* I suggested the use of ergot in this way. I have never tried the bougies myself, however. In one case of catarrh, when the inflammation was seated near the posterior nares, I applied a solution of ergot and iodine by means of the post-nasal syringe, but the result of the treatment is not known. A solution of ergot in glycerine may also be applied to the nasal mucous membrane by means of a camel's-hair pencil, but I cannot say that I have had satisfactory results from any mode of application which I have tried thus far. If the medicine be applied to the Schneiderian membrane in any way, the iodine should not be added to the mixture at all, or else only in very small quantity.

It is unnecessary to say anything as to the use of this agent in *hemorrhoids*, as it is mentioned now in nearly all the text-books on therapeutics, and is in common use.

It seems almost needless also to say anything as to its use in *metritis* and *endo-metritis*. But, although it is mentioned now in nearly all the works on gynecology, its value does not seem to be recognized by the majority of general practitioners.

It appears to be especially applicable in *cervical metritis*. The manner in which it should be applied depends on the season of the year and the temperature. When the weather is sufficiently cool suppositories are preferable, but in warm weather it is difficult to handle them and keep them from melting. The addition of extract of belladonna increases the efficacy of the ergot, and also tends to relieve any pain which may be present. The following formula I have found serviceable: Ergotine (or solid extract of ergot), grs. xx; extract of belladonna, grs. ij; cocoa butter, q. s. M

Make into six suppositories and insert into the vagina every night after using the hot douche.

In November, 1876, I saw a woman, 40 years of age, who had been suffering for several years with the usual symptoms of cervical metritis and prolapsus. Upon examination the neck was found to be enormously hypertrophied, hard and nodulated; so great indeed was the enlargement and firmness of the part that one of the physicians who saw the case considered it due to cancer. The os was patulous and the sound penetrated a distance of about  $4\frac{1}{2}$  inches. On careful examination through the vagina and abdominal walls, I could detect but little enlargement of the body of the uterus. At the menstrual epochs the flow was very profuse, and in the intervals there was a considerable discharge of tough mucus mixed with pus. The woman was greatly debilitated, and confined to her bed most of the time. Quinia, iron, and arsenic were advised, together with a generous diet. I commenced also the administration of ergot by the mouth, but had to desist in a day or two on account of the nausea which it produced. The use of the suppositories of ergot and belladonna was then commenced, and continued steadily except at the menstrual periods until February, 1877. She had then improved very greatly, and there was a decided diminution in the size of the neck of the uterus. The suppositories were omitted for a month and then resumed. I did not see her again until the following November just one year after the treatment was commenced. The cervix was then of natural size and the menstrual discharge also natural in all respects. The treatment in this case was continued with only a month's intermission for a year, but the results were certainly most gratifying. I should have stated, however, that there was still a *slight* mucous discharge during the interval between the menstrual periods.

In warm weather a solution of ergotine and extract of belladonna in glycerine and water may be used in place of the suppositories, as in the following formula: Ergotine (or Squibb's solid extract),  $\text{℥ss}$ ; extract of belladonna, grs.  $\text{vj}$ ; water and glycerine,  $\text{āā f}\text{℥iv}$ . M.

A pledget of cotton is to be saturated with this solution, and inserted into the vagina at bed-time after the hot douche. The cotton should, of course, be removed in the morning.

It has been proposed to paint a solution of ergot on the os and cervix with a camel's-hair pencil, and favourable reports of this mode of treatment have been published. So far as my own experience enables me to judge those cases where there is a copious discharge of mucus or pus are much less amenable to treatment than others, and this is probably due to the fact that the medicine remains in contact with the diseased surface such a short time before it is washed off. And I would call attention just here to the advantages of glycerine over water as a *vehicle* when ergot is applied to mucous membranes where it is liable to be speedily washed off. The tenacious properties of glycerine keep the remedy longer in contact with the diseased surface, and in addition to this the glycerine itself is, as Dr. Marion Sims long ago pointed out, of decided value in reducing some of these chronic inflammatory engorgements. When ergot is applied to the

eye, however, only sufficient glycerine should be added to prevent the mixture from spoiling.

In addition to the topical application of ergot to mucous membranes it is highly probable that it will be found of service when applied to the skin over points of chronic inflammation. I say it is *probable*, because so far as I know no observations on this point have as yet been made, and my own are too few in number to lead me to any definite conclusions. I have used a solution of ergot and iodine in glycerine in several cases of glandular enlargement, but the result was not encouraging. In chronic inflammation of the joints I have had no opportunity as yet to try this mode of treatment, nor have I used it for any of the neoplasms (except internal fibroids, hypodermically, and in the form of vaginal suppositories), the growth of which it might check. When applied to the skin with a view to its absorption the vehicle should be either glycerine or one of the oils. An oleate would be a convenient form for application, and morphia could be added to this if it was thought advisable. Certain *indolent ulcers* in which the bloodvessels were enlarged would probably be benefited also by the application of ergot either with or without iodine. I cannot speak from experience, however, on this point.

I do not for a moment suppose that ergot administered in this way can take the place of its administration hypodermically or by the mouth, but each method has its special field of applicability, and I am convinced that the value of the agent when locally applied has not been duly appreciated by many practitioners. Hypodermic injections are painful when ergot is the agent administered, and every physician who has given the remedy at all has doubtless observed how nauseous it becomes to the patient after a few days when administered by the mouth; hence in such cases as neoplasms or chronic inflammations of parts adjacent to the skin it would seem advisable to practise this method of administration, or at all events to resort to it when the other avenues are closed.

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#### ARTICLE VIII.

NOTES ON INTRA-OCULAR LESIONS PRODUCED BY SUNSTROKE. By F. C. HOTZ, M.D., Ophthalmic Surgeon to the Illinois Charitable Eye and Ear Infirmary, Chicago.

AMONG a great number of cases of atrophy of the optic nerve we occasionally meet with a patient who traces the beginning of his eye trouble back to an attack of sunstroke. He is positive in his assertion that previous to that accident his sight was perfect, but began to fail sooner or later after it. The ophthalmoscope reveals a white or bluish-white papilla, with thin arteries and often pigmented outlines.

The etiological connection between sunstroke and atrophy of the optic nerve in such cases is unquestionable; and the appearance of the atrophic disk would indicate that the atrophy was the result of optic neuritis.

It is therefore remarkable that the ophthalmological literature has given so little attention to defects of sight induced by sunstroke; it is strange that we can scarcely find an allusion to sunstroke as a remote cause of neuro-retinitis, atrophy of the optic nerve, and other intra-ocular lesions.

Most of the text-books on diseases of the eye (Wells, Carter, Mackenzie, Walton, Arlt, Stellwag, Schweigger, etc.) give us no information whatever about the possible effects of sunstroke upon the eye.

In that excellent and carefully compiled *Handbuch der Gesammten Augenheilkunde*, I could find only this vague allusion:<sup>1</sup> "Cases are also reported in which similar defects of sight are said to have been induced by the effect of the scorching heat of the tropical sun."

Macnamara<sup>2</sup> is the only writer who speaks more positively on the subject:—

"It is not an uncommon thing to meet with people in India suffering from headache induced by over-exposure to the sun; the papilla will often be found intensely congested under these circumstances, the capillaries of the retina being somewhat hyperæmic also. The glare of the tropical sun seems to overstimulate the retina, and it becomes congested and swollen; if the exciting cause continues in operation, the irritation is propagated to the brain, and headache and irritative fever ensues.

"It seems to me that irritation, under these circumstances, begins in the retina, because I have frequently found in my own case, that a pair of coloured glasses has saved me, when exposed to a tropical sun, from the distress produced by the glare, and subsequently headache, which one so frequently experiences unless the eyes are thus guarded."

This view does not seem to me to give a satisfactory explanation of the causative relation between sunstroke and eye trouble. And, certainly, the following observations which I gathered during the past year do not support it.

CASE I. *Heatstroke followed by Partial Paralysis of Left Arm and Optic Neuritis of Right Eye.*—Mr. Adolf St., aged 29, manufacturer, was prostrated by the excessive heat in July, 1878. Though he was not exposed to the direct rays of the sun, he became dizzy, and fell down. When he recovered he had lost the use of his left arm, and suffered from violent frontal headache. To his right eye the air seemed to be in a wavering motion. Two months later the headache ceased, but sight of right eye became very dim.

Examination on August 22d, 1878. L. E., V =  $\frac{20}{20}$ , emmetropic; fundus normal. R. E., fingers at six feet; hemianopsia, the temporal half of visual field being completely obscured. Media clear; the nasal half of disk swollen and red, so much so that its boundary cannot be discovered. Around the still distinct temporal outline a narrow crescent of choroidal atrophy.

Treatment: Heurteloup; and infusion of fol. jaborandi.

<sup>1</sup> Leber, on Retrobulbar Neuritis resulting in Partial Atrophy, vol. v., p. 837.

<sup>2</sup> Manual of Diseases of the Eye, 3d ed., 1878, p. 437.

28th. The jaborandi produced profuse perspiration, beginning about fifteen minutes after he took the infusion, and lasting over one hour. Optic disk is paler. V the same. Ordered iodide of potassium, 1.5 *pro die*.

Sept. 11. Retina and optic disk appeared normal in colour. Perception restored in the temporal half of the field of vision. V = fingers at fifteen feet.

24th. Crescent round the outer side of optic disk seems broader. V =  $\frac{2}{3}$ , with — 18  $\frac{2}{3}$ .

Oct. 6. V =  $\frac{2}{3}$ , with — 40  $\frac{2}{3}$ .

The same result was obtained two months later.

CASE II. *Heatstroke; Optic Neuritis of Right Eye*.—Mrs. Maria M., aged 41 years, housemaid, of Oak Park. In July, while ironing in a hot kitchen, she was overpowered by the heat, and afterwards suffered from the most violent headache, attended with fever, lasting about three weeks. Since then she noticed a mist before her right eye. Sight of both eyes had always been perfect.

Examination September 13, 1878. L. E. normal; V =  $\frac{2}{3}$ . R. E., V =  $\frac{2}{3}$ ; media transparent; papilla opaque, and so red that it cannot be distinguished from the surrounding retina. Two leeches were applied to right temple; patient ordered to remain in a darkened room for one week, and to take tinctura rhamnus frangulae.

20th. Papilla is paler; its boundary visible; V =  $\frac{2}{3}$ .

Oct. 2. Papilla clear, vessels normal; its outlines well defined; V =  $\frac{2}{3}$ .

CASE III. *Slight Attack of Sunstroke; Optic Neuritis of Right Eye*.—Mr. John L., aged 35 years, travelling agent, has always been in good health, never had syphilis, and had never noticed any difference in the sight of his eyes. On one of the hottest days in July, while going about to visit his customers in town, he was overcome by the heat, became dizzy and faint, and fell down on the street. He was taken home in a carriage, and was confined to his bed for three days with severe headache. On the 29th of July he observed the eclipse without protecting his eyes by smoked glasses. Three days after, he noticed that all objects to his right side appeared as though they were wrapped in a mist. He consulted me on the evening of the 29th of September. As I expected to see the patient again on the following day at my office, where I could better test his sight, I deferred the further examination of the disturbance of vision, and only ascertained that on closing the left eye and looking with the right at my fingers he could see the thumb, index, and middle fingers distinctly, while the ring and little fingers appeared very dim. The ophthalmoscope revealed transparent media, a hyperæmic swollen papilla, with indistinct outlines, and a grayish mist cast over a large portion of the nasal half of the retina.

I regret to give the history of this case as incomplete as it is; but the patient did not return.

CASE IV. *Sunstroke followed by Neuro-retinitis in both Eyes*.—Thomas Murphy, aged 48 years, labourer, of Jacksonville, Ill., was admitted to the Illinois Charitable Eye and Ear Infirmary on the 7th of November, 1878. In July, after working in the sun and drinking freely, he suddenly became dizzy, and lost the sight in the lower halves of fields of vision. He says he could see distinctly straight ahead or above him, but could hardly see the steps when going down stairs. Gradually his sight improved to a certain extent.

On examination R. E.  $V = \frac{2}{60}$ , L. E.  $V = \frac{2}{100}$ ; slight epithelial opacities in both corneæ, of which patient could give no information. Pupils very small, but active. Optic disks very red, slightly swollen; boundaries quite indistinct; veins very full; arteries about normal.

The treatment was begun with cathartic pills, and then potassic iodide and bromide was given. Under this treatment the sight improved so that on December 9th we found R. E.  $V = \frac{2}{60}$ , L. E.  $V = \frac{2}{60}$ ; disks more distinct and less red; and, when the patient was discharged, March 3, 1879, the vision of right eye was  $\frac{2}{60}$ , that of the left eye  $\frac{3}{60}$ .

To these cases I will add one which was observed in 1873, and another one which was under the care of Dr. W. T. Montgomery, of this city, who kindly furnished me the notes of his case.

CASE V. *Optic Neuritis of Left Eye; History of Sunstroke.*—Mr. Thomas S. H., aged 32, merchant. Examined on August 24, 1873. Was sunstruck in July of previous year; since then he was troubled with the perception of an apparent wavering motion of the air, and the sight of left eye gradually grew very dim. R. E.  $V = \frac{2}{60}$ , emmetropic and normal fundus. L. E. fingers at 10 feet; disk very red, streaked, and swollen; its outlines indistinct; surrounding retina cloudy. Heurteloup to left temple. Bichloride of mercury 0.006 three times daily.

Aug. 31. L. E.  $V = \frac{3}{60}$ . Another Heurteloup.

Sept. 15. L. E.  $V = \frac{2}{60}$ . Retina clear; disk slightly flushed, but its boundary well defined.

CASE VI. *Neuro-retinitis following Heatstroke.*—Mary J. B., aged 34, farmer's wife, consulted Dr. Montgomery on account of eye trouble September 17, 1878. Patient stated that she had weak eyes for ten years, and had been troubled with motes floating before them. Vision good until about six weeks ago. The weather at that time was very hot, and she was very busy cooking for harvest labourers, and became overheated. Did not become unconscious from the heat, but was very much oppressed by it, and this oppression was soon followed by severe headache, and the sight of left eye began to fail. Patient's general condition fair. Still complains of headache. R. E.  $V = \frac{2}{60}$ , L. E.  $V =$  perception of light.

Ophthalmoscope, right eye, general hyperæmia of fundus; left eye, papilla swollen, outline of disk very indistinct; general cloudiness of whole fundus, but most marked in region of disk and outer portion of field.

The patient could not remain in city for treatment, and was only examined once. Prescribed potassium and sodium bromide ñā gr. x three times daily. A succession of blisters to temple and behind ear, rest in a dark room, and bowels to be kept lax.

Husband wrote November 1st that the treatment had been faithfully followed, and that patient had improved very much. Heard nothing more from her.

These observations show a most significant similarity. The patients were exposed to excessive heat until they succumbed to its noxious effect. After recovery from the immediate shock, they suffered from a violent headache for several weeks, and sooner or latter their eyesight began to fail; and in all cases optic neuritis and peri-neuritis was found as the pathological condition of the eyes so affected.

These clinical facts, I think, show pretty conclusively that the neuritis

is a secondary affection, resulting from a primary lesion produced by the heat within the cranial cavity. And I believe, with our present knowledge of the anatomy of the optic nerve, it is not difficult to indicate the way by which the intra-cranial affection is propagated to the intra-ocular portion of the optic nerve.

Among the few things pathologists agree upon in regard to the morbid changes which sun or heat strokes induce in the human body, are the facts that we generally find a marked congestion of the sinuses and nerves; sometimes a sanguineous effusion between dura mater and cranium; a certain quantity of serum at the base of the brain; and the gray substance more or less hyperæmic.

On the other hand, Schwalbe has established the fact (confirmed by other investigators) that the sheaths which envelop the intra-orbital portion of the optic nerve must anatomically be considered as direct continuations of the meninges. The external neurilemma of the optic nerve is a part of the dura mater and arachnoid, the internal neurilemma a part of the pia mater, and the space between these two sheaths—the intervaginal space—is in open communication with the arachnoidal space of the brain. Ever since these anatomical facts have been clearly understood, it has been pretty generally conceded that they afford a satisfactory explanation for clinical observations, which associate optic neuritis frequently with intracranial diseases. It was thought that disturbances of the circulation in the meninges could be communicated to the sheaths of the optic nerve on account of their contiguity.

Upon this basis, I think, we can found a correct interpretation of the clinical features of the above cases. We may presume the excessive heat caused hyperæmia of the meninges, congestion of the sinuses; in some cases, perhaps, also a serous exudation at the base of the brain.

The severe headache that most of the patients were suffering from, a headache lasting from two to three weeks, is an evident sign of a disturbed circulation in the cranial cavity. This irritation was communicated to the sheaths of the optic nerve, and produced ultimately the ophthalmoscopic symptoms of peri-neuritis and neuritis.

It does not militate against this view that in the majority of cases the head symptoms had ceased before the patient noticed any disturbance of sight. For it does not prove that during the period of headache the optic nerves were not affected. We know that a certain degree of congestion of the optic nerve may exist without any appreciable impairment of vision; we know that peri-neuritis interferes but slightly with the nutrition and function of nerves; while in *neuritis* the nerve-substance suffers material changes in structure and function. In two of the cases on record (Nos. 4 and 5) the sight was impaired directly after a severe sunstroke; in the other four cases (Nos. 1, 2, 3, and 6) the visual defect supervened after a period of headache.



Patients 1, 2, and 6 had an attack of heat-stroke, and No. 3 a slight attack of sunstroke, while Nos. 4 and 5 had a severe attack of sunstroke.

It will be noticed that the severity of the attack had an evident bearing upon the earlier or later occurrence of the eye trouble. The severer the sunstroke the sooner vision was disturbed.

I am therefore inclined to think that in the severe cases the graver disturbance in the brain at once propagated the graver form of disturbance, *neuritis*, to the optic nerve, while the lighter attacks first gave rise to a *perineuritis*, which lasted a few weeks without disturbing the functions of the optic nerves; but ultimately the inflammation extended into the substance of the nerve, developing optic neuritis, which all the cases presented at the time of examination. If the limited number of my observations would permit me to form an opinion in regard to the prognosis of this solar optic neuritis, I would say, judging from the good results obtained in all cases which were under treatment, that the disease is quite amenable to treatment.

It will be manifest that my opinion of the relation between the optic nerve affection and the head trouble is essentially different from the view advanced by Macnamara. I may say with Dr. Allbutt:<sup>1</sup> "Macnamara supposes that the cerebral irritation is due to advance of the solar irritation from the retina upwards; my view would be rather the reverse."

My observations certainly do not sustain Macnamara's view. The strongest argument against him is the fact that heatstroke and sunstroke produced identical symptoms. It so happened that among the six cases of neuro-retinitis three were the result of sunstroke and three were due to heatstroke. Inasmuch as these latter cases were not exposed to the glare of the sun, the retina could not be the primary seat of solar irritation. Again, the effect of glaring light upon the retina shows itself most particularly at the most sensitive part of this tunic; the overstimulation causes a dulness of the perceptive power of the whole retina, but the impairment is especially marked in the region of the yellow spot. Such patients complain of scotomata; but none of our patients noticed anything of this sort.<sup>2</sup> It will be remembered that the pathological changes observed in the fundus oculi have been limited to the area of the papilla, or, where they extended beyond it, the disturbance of the retinal tissue was very slight compared with the change of the optic disk. We can understand this, if we consider the ocular trouble as being propagated from the brain to the optic nerve. But it is very improbable that an irritation of the retina strong enough to produce secondary disturbances in the optic

<sup>1</sup> Use of Ophthalmoscope in Diseases of Nervous System, 1871, p. 99.

<sup>2</sup> The only patient who exhibited anything like a scotoma is the one (Case III.) who exposed his eyes to the glare of the sunlight, in observing the eclipse with the unprotected eye. The extensive obscuration of his visual field was due to the effect of the glare; and in this case alone we find the retina more extensively affected than in all other cases.

nerve and brain should cause scarcely any change in the structure and appearance of the primary seat of irritation.

Optic neuritis, however, does not seem to be the only secondary affection of the eye induced by sunstroke. The severest attacks may be followed by a high degree of choroiditis exudativa, with subsequent detachment of the retina, as the following observation will show.

CASE VII. *Insolation followed by Severe Headache; Detachment of Retina in Left Eye.*—Mr. John W., aged 32 years, native of Holland, labourer, was admitted to the Illinois Charitable Eye and Ear Infirmary, on July 16, 1878, with the following history. On July 8th, while working in the hot sun on the roof of a building, he was seized with severe frontal headache, which continued until in the night of July 12th; then it ceased. Upon rising in the morning of next day, he, for the first time, discovered that he had almost entirely lost the sight of his left eye, only a little perception remaining in the upper region of the visual field; but this also left him by noon of the same day.

Ophthalmoscopic examination: Cornea, iris and lens were normal. Vitreous humour somewhat cloudy; upper half of retina detached in three bladder-like folds, one above and one on either side. Lower half of retina still attached, but quite opaque.—T. Patient was given iodide and bromide of potassium, 0.5 grams of each; and pressure bandage was applied to the eye.

17th. Eye is painful and very sensitive to pressure; slight perception of light. Pupil is dilated by atropia; the nasal fold of the detached retina is much smaller.

18th. Pupil still dilated; iris markedly discoloured, of a greenish cast (right iris being light blue). Vitreous humour is more clouded, and filled with numerous small black and floating bodies like coal-dust.

23d. Has had no pain since last date. Iris less discoloured; vitreous clearer; retina re-attached, except at the lower nasal portion; can count fingers at a distance of eight feet.

30th. Vitreous clear; but detachments of retina more extensive again, involving the whole lower half.

*Remarks.*—The unusual severity of the headache, attended by fever, makes it very probable that the insolation has caused an inflammation of the meninges, and a serous exudation over some portion of the left half of the brain. Through the intervaginal space of the optic nerve the inflammatory process reached the eyeball, involving its uveal tract. The cloudiness of the vitreous humour, the tenderness of the globe, the subsequent discoloration of the iris, are evident symptoms of a *choroiditis exudativa* which led to the detachment of the retina. This explanation is founded upon the clinical experience that if, in the course of acute inflammation of the meninges, the eyeball becomes involved, the inflammation is usually propagated to the uveal tract, and not to the retina. That this propagation takes place through the agency of the intervaginal space is very plausible, if we consider the anatomical relation of its ocular terminus to the choroid. Schwalbe gives the following description of it:<sup>1</sup>—

<sup>1</sup> Graefe & Saemisch, *Handbuch der Ges. Augenheilkunde*, vol. i. p. 330.

"The fibres of the external sheath simply pass over into the external two-thirds of the sclerotica; external neurilemma of the optic nerve and sclerotica are continuous. The inner neurilemma, or pial sheath, becomes firmly attached to the surface of the optic nerve, which it accompanies to the vicinity of the choroid; here the larger portion of its fibres is blended with the inner third of the sclerotica; only a few of them can be traced into the texture of the choroid, which at this place is firmly united with the sclerotica. The intervaginal space gradually tapering off, advances between both sheaths to the closest proximity of the choroid, from which it is separated only by the thin layer of sclerotica, which is identical with the pial sheath of the optic nerve."

From the close proximity of the terminus of the inter-vaginal space to the choroid, we can well understand that this highly vascular tunic readily responds to the irritating influence of inflammatory products in the inter-vaginal space; and therefore I infer that in this way the inflammation was started in the choroid, which resulted in a serous transudation between it and the retina.

In support of this view I may be permitted to record another case of detachment of the retina, in which the intra-ocular affection must be attributed to a primary lesion of the meninges.

CASE VIII. *Fall upon Head; Detachment of Retina two weeks afterwards.*—Mr. J. H., aged 60 years, had had intermittent fever. For several years past his sight had been slightly impaired. In January he fell down a stairway, striking the ground with his left parietal bone. He did not become unconscious, but the blow stunned him to such a degree that he was obliged to sit still for some time before he was able to get up and walk. For three or four days he had a violent pain over the left side of his head; but he is positive that the sight of the left eye was still as good as before the accident. After one week, however, he noticed that perpendicular lines (such as the edges of door-posts) appeared as if they were broken in three pieces, the middle piece being markedly displaced to the left. During the second week the sight of the left eye began to fail, and its visual field became contracted. The obscuration began in the inferior nasal section of the field, gradually extending upwards, until after three or four weeks (latter part of February) the visual field was abolished with the exception of a very narrow segment in the lower temporal section.

I examined his eyes on March 23d. R. E. V =  $\frac{2}{3}$  0; emmetropia; incipient cataract; several of the opaque spokes reaching into the central part of the lens; fundus normal.

L. E. No central vision; only a very limited area of peripheric vision in lower temporal quadrant. Incipient cataract; whole upper half of retina detached, hanging down in a large oscillating curtain, its lower edge running obliquely from above downwards and outwards. Papilla red, but well defined: vessels normal.

Tension not noticeably diminished, but eye slightly sensitive to pressure.

*Remarks.*—The facts in this case are clear. An old man, whose sight has been slightly impaired by incipient cataract, receives an injury of his head, which was followed by a certain degree of traumatic meningitis of the left side. The sight of the left eye was not disturbed immediately after the injury. After the first week he noticed metamorphopsia, and two weeks later the obscuration characteristic of detachment of the retina began

slowly to creep over the left eye. From these facts we can infer that the fall upon the head certainly had not injured the eye; for the disturbance of its functions came on neither immediately nor suddenly, as it should had there been a direct traumatic lesion of the eye.

The slow and gradual growth of the detachment points to a gradual accumulation of serous fluid between retina and choroid, due to the gradual rise of an inflammatory action in the choroid. The late development of this choroiditis, the serous character of its products speak decidedly against the supposition of its being traumatic inflammation. And all the symptoms explain themselves as soon as we suppose that the choroiditis was a secondary affection, propagated from the brain through the inter-vaginal space of the optic nerve in the manner described above in connection with the other case.

#### ARTICLE IX.

THE VALUE OF WARM WATER IN SURGERY. By A. H. GOELET, M.D.,  
of New York.

THE following cases are reported in substantiation of the views advanced by Dr. Frank H. Hamilton in a recent article in the *Buffalo Medical and Surgical Journal* for April, 1879. While the report covers only a limited range of the usefulness of *warm water*, it will be of practical value to all interested in surgical dressings. The cases illustrate the value of the use of warm water in *erysipelas*, especially *traumatic*; *lacerated* and *contused wounds* in general, but especially those of the *scalp*, which are so prone to take on erysipelas, and those of *compound fractures*; *gunshot wounds*; and *traumatic gangrene*.

Warm water may be applied in two ways, viz., 1st, by means of the water bath, in which case the limb is submerged in water kept constantly at the same temperature (generally about 100° F.), disinfected when so desired, and changed as often as necessary (about twice a day will generally suffice); 2d, by means of hot fomentations, which consist of a layer of cotton batting, or two thicknesses of sheet lint, saturated with hot water (previously disinfected if so desired), applied closely and evenly to the part, and kept at an even temperature by a covering of oiled silk. In this case it will be necessary to re-wet the dressing about every two hours, and change it twice a day, or oftener in cases where there is profuse suppuration. In cases of erysipelas the dressing must extend a little beyond the limit of inflammation.

#### *Cases of Erysipelas:*

CASE 1. *Laceration over Left Eyebrow; Relative Value of Tr. Iodine and Hot Water.*—George M., æt. 14 years, was admitted to the Ninety-  
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ninth Street Reception Hospital March 26, 1874, with the above injury, produced by falling from a rock. The edges of the wound were brought together by three sutures strengthened with adhesive strips.

27th. Tissues around wound look œdematous and red; painted with tr. iodine; sutures not removed.

28th. The surface for some distance around the wound has an erysipelatous blush; sutures removed, surface painted with tr. iodine, and covered with *warm water* dressing (?). The same treatment was continued until the 31st, when erysipelas had extended over the whole face. Iodine discontinued, and hot fomentations *only* applied. The internal treatment consisted of carbonate of ammonia and camphor.

On the following day (April 1st) the erysipelas was beginning to subside, and on the 5th it had entirely disappeared.

CASE 2. *Comminuted Fracture of the Lower End of the Humerus; Slough over External Condyle detached under Warm Water Treatment; Subsequent Development of Erysipelas; Relative Value of Tr. Iodine and Hot Water.*—Wm. D., æt. 13 years, was admitted to Ninety-ninth Street Hospital February 19, 1875, with above injury, having been thrown from a wagon, and struck by the wheel of a locomotive.

March 3d. A bluish spot made its appearance over the external condyle, which in a few days looked gangrenous, and hot fomentations were applied.

On the 14th this slough had become detached, and was removed, exposing the bone. After a few days a fragment of bone became loose, and was removed. Peruvian balsam substituted for the warm water dressing. A few days later erysipelas developed around the wound, and spread rapidly under the iodine treatment alone. It was then painted with tr. iodine, and hot fomentations applied (?), but the erysipelas continued to spread. By advice of Dr. Hamilton, who was our visiting surgeon, the iodine was discontinued, and the arm submerged in water, to be kept constantly at 100° F., to be changed and disinfected twice a day. It commenced to improve immediately, and in three days all signs of inflammation had disappeared.

CASE 3. *Severe Laceration and Contusion of the Foot; Syme's Amputation; Erysipelas of Stump; Relative Value of Cold and Astringent Applications, and Hot Water.*—Patrick G., æt. 21 years, single, labourer, admitted to hospital July 14, 1874. Amputation performed same day, and stump placed in wire suspension apparatus. Four days after (18th) erysipelas developed in the stump, and spread rapidly up the leg under the application of lead and opium wash.

23d. Under same treatment it has extended to the knee, and is of the cellulose-cutaneous variety. Poultices of flaxseed meal applied.

26th. No improvement. Erysipelas still extending. Lead and opium wash reapplied.

31st. The limb is in every respect worse. The erysipelas has extended some distance above the knee. It seems to have baffled the skill of our visiting surgeon (a skeptic as to the value of warm water), whose treatment had been followed up to this date. Hot fomentations were immediately commenced, and kept constantly renewed during the next forty-eight hours. At the end of that time the erysipelas had receded; the redness and swelling had to a great extent subsided; indeed, the improvement was wonderful. Six days after commencing the hot fomentations the erysipelas had entirely disappeared by resolution.

CASE 4. *Erysipelas of a Compound Fracture of the Leg; Developed under Imperfectly Applied Warm Water Dressing; Cured by its Perfect Application.*—J. T., æt. 60 years, male, labourer, admitted to Ninety-ninth Street Hospital January 26, 1875, with a compound comminuted fracture of the tibia and fibula, upper third. On the following day the limb was placed in a wire suspension apparatus and sheet lint, saturated with hot water, applied, but the covering of oiled silk was omitted, and the dressing was not reapplied sufficiently often to preserve an even temperature. Under this treatment erysipelas developed by January 30th, and spread rapidly up and down the leg.

*February 1st.* It was decided to apply the warm water dressing more perfectly, and the whole limb below the knee was enveloped in sheet lint wet with hot water, and the whole covered with oiled silk. In consequence, by the 3d the swelling and redness had disappeared to a great extent, and on the 5th it had entirely subsided.

Dr. Hamilton records one case in which erysipelas developed under the warm water dressing, but imperfect application was no doubt the cause, as it has never happened in my experience.

CASE 5. *Erysipelas from a Scalp Wound Rapidly Subsiding under the Warm Water Dressing.*—T. F., æt. 29 years, male, painter, was admitted to hospital January 14, 1875, with a wound of the scalp four inches long, extending from the left brow back across the frontal bone and the squamous portion of the temporal bone to about two inches above the upper border of the left ear. The periosteum was peeled up, exposing the bone for the whole length of the wound. It was closed by four silver wire sutures.

On the 16th erysipelas had developed, spreading in all directions. The sutures were removed, and lint saturated with hot water applied to the whole inflamed surface, and covered with oiled silk, held in place by a four-tailed bandage. On the following day the erysipelas had entirely subsided.

There was no constitutional treatment in this, nor any of the cases recorded, except where so specified.

CASE 6. *Erysipelas in a Compound Fracture; Removed in Twenty-four hours by Hot Fomentations.*—R. B., æt. 43 years, female, received a compound comminuted fracture of the lower third of the humerus March 14, 1875. 16th. Erysipelas developed, which spread rapidly to the middle of the arm by the afternoon of the same day. Hot fomentations were immediately applied, and on the following day the inflammation had all disappeared. No internal treatment.

CASE 7. *Idiopathic Phlegmonous Erysipelas of the Leg.*—Mrs. T., æt. 44 years, was attacked with simple erysipelas of the lower part of the left leg, but some kind friends recommended liniments, and under this treatment it spread rapidly, so that on the 9th of June, 1875, the whole leg from the ankle to the knee was found in a terribly inflamed condition, involving both the skin and subcutaneous cellular tissue. Hot fomentations were immediately commenced, consisting of cotton batting saturated with hot water, and covered with oiled silk. This to be re-wet every two hours.

11th. A small abscess was opened on the anterior portion of the leg just

below the knee. The redness and swelling, which were very great, have subsided wonderfully.

13th. That portion of the leg where most of the liniment was used has become denuded of skin, but the inflammation has entirely subsided.

In this case tr. iron was given internally in large doses.

### *Traumatic Gangrene:*

CASE 8. *Severe Laceration of both Dorsal and Plantar Surfaces of Left Foot, with Compound Fracture of First, Fourth, and Fifth Metatarsal Bones; Foot saved by Immersion in Warm Water.*—Charles G., æt. 47 years, labourer, received the above-named injury April 2, 1874.

5th. Foot looked gangrenous, and was submerged in water at 90° F., by advice of Dr. Hamilton, Consulting Surgeon. But for his knowledge of the value of warm water in such cases, he would have advised amputation at the ankle, as the only means of saving the patient's life. (The temperature of the bath was subsequently raised to 100° F.)

8th. The leg above the level of the water was a little œdematous.

9th. The whole dorsum of the foot is involved in the injury, and is sloughing.

10th. Where the tissues have sloughed fresh granulations are springing up.

12th. Ninth day of immersion, the œdema is much less. The whole dorsal surface has sloughed, leaving a fresh granulating surface. After the 15th the water bath was used during the day, and hot fomentations were applied at night. After the 19th hot fomentations alone applied.

22d. Three grafts applied to the dorsal surface, and hot fomentations continued.

26th. Water dressing discontinued. The grafts have taken nicely, and are spreading. Fresh grafts inserted.

May 1st. A few of the second crop of grafts have taken.

June 9th. When nearly well he was transferred to Bellevue Hospital. After his discharge he returned (August 10th) to show us that he had a good and useful foot.

CASE 9. *Gangrene following Fracture of the Leg; Spontaneous Amputation under the Water Bath.*—H. B., æt. 26 years, male, received, December 8, 1873, a simple fracture of the tibia and fibula at the lower third, with extensive laceration of the tissues, involving the vessels of the limb.

11th. The foot looked gangrenous, and sensation below the seat of fracture was entirely lost. An erysipelatous blush extended up the leg from the seat of fracture. The whole limb below the knee was immediately immersed in a water-bath at 100° F., by advice of Dr. Hamilton.

14th. The line of demarcation had formed at the seat of fracture, and the erysipelas had disappeared.

19th. The limb was removed at the seat of fracture by means of dressing forceps and scissors, with very little loss of blood, and hot fomentations applied to the stump. Patient recovered with a good stump after resection of about an inch of lower end of the tibia.

CASE 10. *Gangrene resulting from Severe Contusion of the Leg; Arrested by Warm Water.*—Thomas C., æt. 23 years, sustained, November 17, 1874, a severe contusion of his left leg and foot, with rupture of the smaller vessels, and extravasation of blood into the tissues of the whole leg. Compresses, saturated with lead and opium wash, applied, and the limb placed in a fracture box.

18th. The whole leg is black, the toes are cold and bloodless, and sensation of the foot is entirely lost.

22d. The line of demarcation is forming in one place just behind the internal malleolus.

24th. Gangrene is becoming more marked. Hot fomentations applied to the limb below the knee.

27th. Small sloughs behind the internal malleolus, and on the outer surface of the leg have separated, leaving healthy granulating surfaces. The remainder of the leg and foot are regaining a healthy appearance. No febrile disturbance. Several grafts were subsequently placed along the margin of the external wound, which took nicely. The wounds soon healed, and the patient made a good recovery.

CASE 11. *Compound Fracture of the Foot, with Severe Laceration; Separation and Removal of the First and Second Phalanges of the Third Toe under the Water Bath.*—Bernard W., æt. 45 years, sustained the above injury January 11, 1874. On the following day, after all bleeding had ceased, the foot was immersed in a water-bath at 100° F.

13th. The lacerated tissues presented a gangrenous appearance.

19th. After some sloughing of the tissues the first and second phalanges of the third toe were found to be loose, and they were removed; and on the following day the first and second phalanges of the second toe were likewise removed.

23d. The wounds were granulating nicely. Hot fomentations were then used at night, and the water-bath during the day.

29th. Hot fomentations alone applied. Subsequently the wounds healed without complication.

#### *Lacerated Wounds of the Scalp:*

CASE 12. *Compound Comminuted Fracture of the Anterior Table of the Occipital Bone.*—Edward B., æt. 27 years, labourer, sustained the above injury November 12, 1874. One silver suture, inserted in the centre of the wound, which was a long one, and the ends left open for drainage.

14th. The wound is suppurating, but the pus looks greenish and unhealthy, and small particles of bone are coming away with it. Hot fomentations applied.

16th. The wound is granulating nicely.

24th. The wound has healed without any complication.

CASE 13. *Laceration of the Scalp an inch and a half long.*—James D., æt. 15 years, sustained the above injury September 1, 1874, the laceration extending longitudinally over the anterior superior angle of the right parietal bone. Two sutures were inserted and hot fomentations applied. The sutures were removed on the second day, and the wound had healed partly by first intention; and by the 8th it had healed entirely without any complication.

CASE 14. *Laceration of the Scalp over Left Parietal Bone.*—Jeremiah C., æt. 11 years, sustained the above injury November 2, 1874. Hot fomentations applied at once. A surgeon opposed to warm water, at the time remarked that the patient was sent home for the wound to suppurate. But in his note of the 4th he states that the wound is healing nicely, and on the 10th the patient was discharged, cured without any complication.

The same surgeon, in treating an incised wound of the scalp a few days later, closed it with wire sutures. The third day after, when it com-



menced to suppurate and look unhealthy, he immediately applied warm water dressing, and the wound healed by granulation.

Cases 12 and 13 were treated in a hospital full of traumatic erysipelas.

*Wounds of Compound Fractures and Lacerated Wounds in general:*

CASE 15. *Compound Fracture of the Leg treated successfully by Warm Water.*—Thomas A., æt. 20 years, admitted to hospital March 11, 1874, with a compound fracture of the tibia and simple fracture of fibula at the junction of the middle and lower thirds. The limb was placed in a suspension apparatus and the wound dressed with hot fomentations immediately on admission.

April 5. The lower end of the tibia was found to be projecting, and on the 17th it was removed with bone nippers, the same treatment being continued.

27th. The wound was healing nicely, there having been no complication.

CASE 16. *Compound Fracture of the Tibia and Fibula; Plaster of Paris Splint applied; Fenestræ cut over the Wounds, which were treated successfully by Warm Water.*—William McG., æt. 35 years, was thrown from his wagon, the wheel of the vehicle passing over his leg. Admitted to hospital same day, September 15, 1874. On the following day a plaster-of-Paris splint was applied and fenestræ cut over the two wounds, to which hot fomentations were applied. The patient made a good recovery without any complication, the wounds healing by granulation.

CASE 17. *Compound Comminuted Fracture of the Radius; Recovery under Warm Water Treatment.*—Miles C., æt. 38 years, admitted December 18, 1874. While ramming a load of "giant powder," it exploded, splintering the ramrod, and driving a piece of it through the forearm at the lower third, with the effect of producing the above injury. A single palmar splint was at first applied, with a compress and bandage to control the bleeding.

On the following day the surfaces around the wound looked red and swollen, and the limb was placed in a suspension apparatus and hot fomentations applied to and around the wounds. By the next day (20th) there was marked improvement, the redness and swelling had entirely disappeared, and the wound was beginning to suppurate. The hot fomentations were continued until January 12, when the wounds were so nearly healed as to allow a re-application of the palmar leather splint. No complication followed.

CASE 18. *Pistol-shot Fracture of the Radius; Ball not removed until the Twenty-second Day after the Injury; Successful Treatment by Hot Fomentations without any Complication.*—Michael K., æt. 78 years, labourer, admitted January 26, 1875, on which day he received a pistol-shot wound of the forearm about two inches above the radius, fracturing that bone in several places, the ball passing in on the dorsal aspect and lodging. It could not be found. On the following day the limb was placed in a suspension apparatus, and hot fomentations applied to the wound.

Feb. 17th. The twenty-second day after the injury, an abscess was opened on the palmar surface, and the ball, with some small pieces of bone, came away with the pus. The hot fomentations were continued, and the patient made a good recovery without any further complication.

Cases 15, 16, 17, and 18 were treated in a hospital ward with pyæmia and traumatic erysipelas.

CASE 19. *Incision of both Superficial and Deep Palmar Arches; Secondary Hemorrhage occurring after the fourth week from the Deep Arch; Ligation of the Radial Artery; Subsequent Treatment of the Wound by Hot Fomentations.*—Thomas McM., æt. 16 years, applied for treatment of secondary hemorrhage from the deep palmar arch March 16, 1879, about four weeks after the accident. The extremities of the arch could not be reached in the wound, so the bleeding was controlled by a compress of styptic cotton to the wound, and he was advised to have the radial artery ligated. The patient objected strenuously, and the parents preferred to postpone it. They finally consented to the operation April 3d. At this time the margins of the wound were inflamed, and an erysipelatous blush extended up the wrist. Immediately after the operation the cotton was removed and hot fomentations applied to the wound and inflamed surface. On the following day the redness had entirely disappeared, and the wound was granulating.

At this date (April 16th) the wound of the hand has healed under the same dressing continued since the operation.

The following case will show the relative value of cold and hot water in acute inflammation:—

CASE 20. *Acute Inflammation of the Knee-joint developed under Extension.*—Katie D., æt. 4 years, who had been under treatment two years for chronic inflammation of the knee-joint, and was running around with Dr. Sayre's knee extension apparatus applied, was attacked suddenly with acute inflammation of the joint, without any ascertainable cause except the extension. Ice cloths were applied and the extension lessened, but the inflammation extended rapidly up the thigh and down the leg, accompanied with great swelling and redness, presenting the appearance of erysipelatous inflammation. The swelling was so great two days later (Jan. 24th, 1879) as to necessitate the removal of the instrument. The ice cloths were continued to the whole inflamed surface and around the joint, and a posterior wooden splint applied to keep the joint at rest.

26th. The inflammation of the tissues continued to extend and the joint was even worse. An ice bag was applied around the joint, and the cold cloths to the thigh and leg continued.

28th. The whole limb, from the middle of the thigh to the foot, was acutely inflamed, and the joint was exquisitely sensitive. It could not be touched without occasioning screams of agony from the little sufferer. It was even more sensitive than when last seen, and the inflammation of the tissues was extending rapidly. Warm water was immediately determined upon, and the whole limb was enveloped with hot fomentations and covered with oil silk.

30th (only two days later). The improvement was miraculous. The limb could be handled without causing pain, and the redness and swelling had nearly disappeared. The hot fomentations were continued, and in two days more she could stand upon the limb, and the joint could be moved without giving pain. The acute inflammation had entirely subsided. After this the hot fomentations were continued to the joint, and at this date (March 15th) she is walking around without an instrument (only a posterior wooden splint).

In conclusion I will refer to a case of phlegmasia dolens treated successfully by warm water, which was reported by me in the *Hospital*

*Gazette* of November 28, 1878. In this case, after all other means were exhausted and no relief obtained, it was determined to use hot fomentations, which gave immediate relief, and under their continued application a cure was effected.

*Resumé.*—From a study of these cases I think we are justified in concluding that in Case 1 erysipelas could have been prevented if *warm water* had been used instead of the tr. of iodine.

In Case 2 erysipelas could have been arrested in 24 hours had warm water been used at first.

In Case 3 the whole foot could have been saved, in the first place, if it had been immersed in a water-bath, for the injuries were less severe than in Case 8; but, unfortunately, our consulting surgeon was skeptical as to the value of the *warm water* dressing. And in the second place, had hot fomentations been applied when erysipelas first made its appearance, it could have been arrested, and the patient would have been saved much suffering.

Cases 4, 5, and 6 speak for themselves.

Amputation at the knee, or immediately below, would have been necessary in Case 9, if warm water had not been used; whereas, spontaneous amputation took place at the lower third of the leg. In this case, also, erysipelas was arrested by its use.

Case 10 shows that gangrene can be arrested by warm water, and also that grafts will take under warm water dressing.

In Case 11 amputation at the tarso-metatarsal joint was the indication, whereas by the use of warm water the whole foot was saved.

Erysipelas and pyæmia were prevented in Cases 15, 16, 17, and 18.

In Case 19 erysipelas was arrested. This case shows, also, that a wound will cicatrize completely under the warm water dressing.

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#### ARTICLE X.

A COLORIMETRIC METHOD FOR THE QUANTITATIVE DETERMINATION OF THE BILIARY ACIDS AND COLOURING MATTER. By J. O. HIRSCHFELDER, M.D., Professor of Materia Medica in the Medical College of the Pacific, San Francisco.

HERETOFORE there has been no method for the quantitative determination of the biliary acids and colouring matter, which could be quickly performed with a small quantity of bile, and the need of such a method in a set of investigations of the bile led to the discovery of one combining the requisite qualities with tolerable accuracy.

The older methods for determining the biliary acids, the glycocholic and taurocholic acids, demand a great deal of time and attention, and

withal are very inaccurate. The colouring matter has been determined not by direct methods but through exclusion, a mode than which none more unsatisfactory could be imagined.

The oldest method for the determination of the biliary acids is the precipitation of them from an alcoholic extract by means of ether. This precipitate has been proven by Trifanofski<sup>1</sup> to consist only to the extent of 60 per cent. of the salts of the biliary acids, the rest being chloride of sodium and fatty salts of soda. The results that have been attained according to this method by Frerichs and Gorup-Besanez are consequently incorrect.

A second method, by the precipitation from an aqueous solution by sugar of lead and ammonia, is that most in use at present. It is very elaborate, and demands many various procedures, and requires many days for its completion. The precipitate is washed, dissolved in alcohol, and transformed into the salt of soda by the carbonate of soda. The mixture is then evaporated to dryness, and the biliary salt of soda is dissolved out with alcohol. The alcoholic solution is evaporated to dryness, and the residuum weighed. Irrespective of the experimental errors that can occur at each step in the process too high a result is obtained by the palmitate of soda which is present in the bile. It is changed to the palmitate of lead which is soluble in alcohol, and on being changed back again to the palmitate of soda is weighed with the rest. This error might be avoided by washing out the lead precipitate with ether in which the palmitate of lead is soluble, but not the glycocholate or taurocholate.

A third method, that of Hoppe-Seyler,<sup>2</sup> consists in drying the substance, washing with alcohol and then with water slightly acidulated with acetic acid, and filtering. The filtrate is dried, dissolved in alcohol and refiltered. The last filtrate is dried, dissolved in a small quantity of alcohol and precipitated by ether. The precipitate is frequently dissolved in alcohol and reprecipitated by ether in order to free it from inorganic salts, and then is finally dried. It is dissolved in a small quantity of water, and sealed in a glass tube together with crystallized caustic baryta, and then warmed in an oil bath of a temperature of 120° to 130° C. during twelve hours in order to change the biliary acids into cholic acid. The excess of baryta is precipitated by carbonic acid and filtered. The filtrate is dried, acidulated with hydrochloric acid, and ether poured over it. The vessel is allowed to stand uncovered for a few days until the ether evaporates. The cholic acid thus formed is collected on a filter, washed with cold water, dissolved in alcohol, dried at 105° C., and weighed. From the cholic acid formed the glycocholic acid is calculated.

This method is very elaborate and demands a great deal of time, and certainly possesses no advantages over the above-mentioned method of precipitation with lead modified by subsequent washing with ether.

<sup>1</sup> *Plueger's Archiv*, ix., p. 492.

<sup>2</sup> Trifanofski, *loc. cit.*

Inasmuch as none of these methods permits the requisite rapidity and accuracy of determination, and large quantities of the substance to be examined are necessary, I resorted to a new method—a colorimetric one.

As a norm, I determined the dilution of a solution of glycocholate or taurocholate of soda at which the reaction of Neukomm ceases. I found that this reaction always ceased at a certain point, and was therefore entitled to conclude that whenever I diluted a solution until the reaction ceased I had the above found per cent. present in the final dilution. I made the reaction by mixing a drop of the solution with one of a 25 per cent. sulphuric acid and a strong solution of cane sugar upon a porcelain cover, spreading it carefully and gently heating over a small gas flame. A violet color is produced if biliary acid be present in a sufficiently large quantity, but upon the border of the final dilution the violet color becomes more and more indistinct, and finally becomes light brown. This is the point desired.

In this manner I obtained the following result:—

*Glycocholate of Soda.*

10 c. c. solution = 182.3 mgm. glycocholate of soda.

10 c. c. + 90 c. c.  $H_2O$  = 100 c. c. (<sub>a</sub>)<sup>1</sup>

10 c. c. (<sub>a</sub>) + 140  $H_2O$  = 150 c. c. terminal reaction.

10 c. c. orig. sol. = 1500 c. c. term. react. = 182.3 mgm. glycocholate of soda.

10 c. c. “ “ = 1.215 “ “ “

The substance producing the reaction is the cholic acid, and hence if we desire to compute from the value found here at what point the reaction would cease with a solution of the cholic acid, we need only compare the atomic weight of the glycocholate of soda with that of the cholic acid as follows:—

The atomic weight of the glycocholate of soda is 487, and that of the cholic acid is 408, hence

$$487 : 408 :: 1.215 : x$$

$$x = 1.01$$

By direct experimentation we find

$$10 \text{ c. c. terminal dilutions} = 1.0025,$$

which difference falls within the limit of experimental error. In the same manner we would find by calculation for the taurocholate of soda the terminal dilution as follows:—

$$487 : 537 :: 1.215 : x$$

$$x = 1.34$$

The taurocholate of soda with which I experimented was impure, containing probably free cholic acid which reduced the value found so that the result obtained was

$$10 \text{ c. c. terminal reaction} = 1.1$$

<sup>1</sup> (<sub>a</sub>) meaning first dilution.

Inasmuch as in the examination of the bile we do not know whether we have glycocholate or taurocholate of soda present, it will be best to calculate it in the form of cholic acid.

No method for the quantitative determination of the bilirubin heretofore existed except that of Vierordt, through absorption of a part of the spectrum, which is so complicated and demands so much time and care that, although this was until now the only method for the quantitative determination of this highly important substance, it has been hardly ever employed. In the colorimetric method for the quantitative determination of bilirubin the same principle is employed as in the case with the biliary acids.

A solution of bilirubin containing a known quantity of that substance is diluted with water until the play of colour produced in it by nitric acid, the so-called reaction of Gmelin, ceases, and in order to avoid errors through the waste of too large quantities in making the test, I employed small test-tubes, made of glass tubing having a calibre of about four millimetres.

The result was the following:—

11.5 mgm. of bilirubin were dissolved in a small quantity of a solution of the bicarbonate of soda, and diluted so that the mixture was exactly 100 c. c.

$$5 \text{ c. c. solution} + \left. \begin{array}{r} 34 \text{ c. c.} \\ 36 \\ 35 \\ 35 \end{array} \right\} 35 \text{ H}_2\text{O} = 40 \text{ c. c. terminal reaction.}$$

$$\begin{array}{rcl} 100 \text{ c. c. original sol.} & = & 800 \text{ c. c. terminal dilution} = 11.5 \text{ mgm. bilirubin.} \\ 100 \text{ c. c.} & \text{ " } & \text{ " } = 1.43 \text{ " } \end{array}$$

That is to say, the reaction of Gmelin ceases as soon as we have a dilution such that in 100 c. c. of fluid there are contained 1.43 mgm. bilirubin. Inasmuch as in certain experiments we operate with solutions containing less than 1.43 mgm. of bilirubin in 100 c. c. of fluid, I determined at what dilution the colour of the solution was no longer appreciable. For this purpose I took two equally white test tubes, marked off an equal height on both, and compared the colour of the diluted solution in the one with that of a similar column of water in the other.

I found with a column of fluid 8 c. m. in height, the following:—

1 c. c. sol. bilirubin + 49 c. c. H<sub>2</sub>O = 50 c. c. 1st dilution.

$$10 \text{ c. c. 1st dilution} + \left. \begin{array}{r} 150 \text{ c. c.} \\ 140 \text{ c. c.} \\ 150 \text{ c. c.} \end{array} \right\} 146\frac{2}{3} \text{ c. c.} = 156\frac{2}{3} \text{ terminal dilution.}$$

100 c. c. orig. sol. = 78333 c. c. term. dil. = 11.5 mgm. bilirubin.  
100 c. c. = 0.0146 " "

I employed these norms in the examination of the bile, and the result of the chemical investigation of 18 specimens of human bile is shown in the following table :—

*Human Bile.*

No.	Specific gravity.	Water.	Solids.	Inorganic.	Organic.	Bilirubin.		Biliary acid.	
						Gmelin.	Colour test.	Cholic acid.	Glycocholate of soda.
1	1012.86	96.50	3.50	0.89	2.61	0.2288	0.1752	0.0768	0.96
2	1031.44	79.32	20.68	1.40	19.28	0.20755	0.2180	1.728	2.16
3	.....	97.03	2.97	0.73	2.24	.....	.....	.....	.....
4	1024.61	85.85	14.15	1.50	12.65	0.7436	0.7008	1.82	2.4
5	1015.75	90.32	9.68	1.276	8.404	0.3003	0.24528	0.96	1.2
6	1018.52	89.40	10.60	9.67	9.93	0.4004	0.4015	1.152	1.44
7	1030.75	86.46	13.54	2.568	10.972	0.6435	.....	3.648	4.56
8	.....	.....	.....	.....	.....	0.5434	0.5740	1.632	2.04
9	1014.65	92.70	7.30	1.00	6.30	0.5005	0.4380	1.152	1.44
10	.....	.....	.....	.....	.....	1.287	.....	3.84	4.80
11	1016.12	88.15	11.85	1.09	10.76	0.858	.....	0.576	0.72
12	.....	86.10	13.90	1.36	12.54	1.001	1.095	1.92	2.40
13	.....	.....	.....	.....	.....	0.45475	0.4745	1.248	1.56
14	1015.85	90.66	9.34	1.16	8.18	0.858	0.949	1.20	1.50
15	.....	94.67	5.33	0.797	4.533	0.143	.....	0.768	0.96
16	.....	81.60	18.40	1.68	16.72	4.6475	4.9275	3.12	3.9
17	1040.95	78.10	21.90	1.80	20.10	5.3625	5.11	5.52	6.9
18	.....	82.50	17.50	1.80	15.70	5.005	.....	1.776	2.22
Av.	1022.14	88.62	17.38	1.388	9.992	1.49	.....	1.819	2.329

The bile of three dogs examined in a similar manner gave the following result :—

*Bile of Dog.*

No.	Spec. grav.	Water.	Solids.	Inorganic.	Organic.	Cholic acid.	Bilirubin, Gmelin.
1	1036.27	81.26	18.74	1.828	16.12	8.50	0.1573
2	1036.39	81.46	18.54	1.75	16.79	8.75	0.1287
3	1037.30	80.18	19.82	1.86	17.96	13.50	0.23195
Aver.	1036.65	80.96	19.04	1.81	17.23	10.25	0.17265

## ARTICLE XI.

PALATO-PHARYNGEAL TUMOUR. By JOHNSON ELIOT, M.D., Professor of Clinical Surgery in the Medical Department of the University of Georgetown; one of the Attending Surgeons to Providence Hospital.

PHARYNGEAL growths are comparatively of rare occurrence. When they do occur, however, they are extremely annoying to the possessor, and must prove fatal ultimately by interfering with respiration and deglutition. Their removal is always attended with danger. Situated in a highly vascular region, the hemorrhage attending their extirpation is profuse, and the surgeon meets with great difficulty in arresting it, from inability to find and ligate the bleeding vessels. Anæsthetics cannot be administered with

safety. Thus the operator is subjected to the additional annoyance of a consciousness of his patient's sufferings.

But few cases of pharyngeal tumours are reported. The most interesting is that of Skeys (see *Lancet*, 1857, vol. i. p. 242), and approaches nearer in character to the one in question than any recorded.

Some nine years ago I was requested by Prof. Robert Reyburn to see Captain B., aged 29. The captain's history was excellent; he had never suffered from constitutional disease of any description, was physically well developed, and presented a specimen of perfect health. During the late war he served in the army (Federal) as captain of volunteers (infantry), and distinguished himself for valour and endurance in several campaigns. He was wounded three or four times, and at the battle of the "Wilderness" lost his thigh at the upper third by shell-shot. In 1869 he first discovered enlargement in the tonsil gland of the right side; gave but little attention to it at the time. During 1870 part of the growth was removed from the soft palate by Prof. R. Reyburn, it being then quite small in size. The swelling gradually extended to the palate of the same side, affecting his voice without any other inconvenience. Upon examination we found the right tonsil enlarged, with a tumour occupying one-fifth of the hard palate; the palatine swelling was smooth, symmetrical, with the mucous covering apparently thickened; there was also congestion of the surrounding tissues.

The tumour was painless, firm, but slightly resilient on pressure. We came to the conclusion that it was either fibrous or cartilaginous. There was no glandular implication on the cervical or submaxillary regions. He informed us that the tumour had grown slowly; it had not as yet interfered with respiration or deglutition. He sought relief, and expressed a willingness to have it removed, insisting on the administration of ether. We reluctantly acceded to his wishes. A few inspirations of the anæsthetic satisfied us of the danger attending its administration; it was immediately withdrawn. A second attempt to etherize him was made, but discontinued at the approach of asphyxia. After the removal of a small portion of the tumour the case was abandoned, he refusing to submit to the operation without anæsthetics, which we declined to administer.

Early in December last he placed himself under the charge of Dr. Ralph Walsh of our city, and by that gentleman I was invited to see him. Dr. Reyburn was added to the consultation. At this consultation we found him in a truly deplorable condition. The tumour had extended over three-fourths of the hard palate, the uvula and half arches were forced back and obscured from view, the tongue was depressed, with scarcely space to pass the finger between that organ and the tumour. The corresponding sides of the face and neck were enlarged by the external protrusion of the tumour. The connection of the growth between the palatine and submaxillary region was readily diagnosed; pressure on the palatine aspect increased the fullness in the submaxillary region. His respiration was so embarrassed and stridulous that it was painful to be in his company. The recumbent position was "painful and suffocating." His countenance livid, articulation indistinct, mastication painful, and deglutition difficult. He informed me that within the last month the tumour had increased rapidly; he could almost mark its daily growth. He was despondent, anxious, and apprehensive of the result; he felt a cord daily tightening around his neck, that must eventually suffocate him. His affliction was so terrible that life had ceased to be a boon. He was now willing to submit to sur-



gical interference. To insure him every care and attention during his illness, we advised his friends to place him in Providence Hospital, an institution under the supervision of the Sisters of Charity. A consultation of the surgical board of the hospital was held. Professors Ashford, Reyburn, Walsh, and Busey were invited to be present. It was determined at the consultation to operate at an early day. Hoping to give temporary relief, and also for the purpose of exploration, I introduced a small trocar into the palatine tumour on the 26th of December. Nothing escaped from the puncture but a few drops of blood, giving no relief. A question arose as to the proper mode of procedure in the case. Anæsthetics were out of the question, unless tracheotomy was premised and the posterior fauces plugged. The difficulty was solved by the captain offering to submit to the operation without etherization. We hardly hoped to remove the whole mass through the palatine incision, and anticipated a second one in the cervical region. On this point we were agreeably disappointed, as the result shows.

On the 3d of January, 1879, assisted by Prof. J. Ford Thompson, of the hospital staff, Profs. Reyburn, Ashford, and Walsh, a semilunar incision was made on the posterior margin of the hard palate, another was made on its anterior portion, connecting the latter with the first, leaving an ellipse of two inches in width. The circumscribed part was seized with a strong vulsellum, and traction made. The dissection was necessarily slow from frequent interruption by the patient freeing his mouth and throat from blood. An hour elapsed before the cervical portion of the tumour was raised from its bed. The hemorrhage was considerable. No vessels were tied; no hæmostatic used; the bleeding ceased on the completion of the operation; the mass was removed in detached pieces.

Upon superficial examination it appeared to be sarcomatous in character. A portion of it was preserved for microscopic examination, but by some accident was mislaid. Its slow and painless growth, partially capsulated character, the unimplicated glands in the vicinity of the tumour should encourage us to hope for no further trouble. The result of the operation thus far has been highly gratifying. The captain's articulation is now clear, respiration easy, deglutition unimpaired.

The tumour evidently originated in the tonsil gland, and slowly encroached on the palate, meeting with resistance at this point. It took a downward course in the walls of the pharynx, where it met with less opposition, and finally made its appearance in the more yielding tissues in the submaxillary and cervical regions. An examination of the patient a few days since shows no manifestation of the return of the disease.

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#### ARTICLE XII.

INTRA-ORBITAL SARCOMA, FORCING THE EYE DOWNWARDS AND FORWARDS;  
REMOVAL, AND REPLACEMENT OF THE EYE. By JOHN H. PACKARD, M.D.,  
Surgeon to the Episcopal Hospital, Philadelphia.

Mrs. D., now æt. 67, was first seen by me some ten years ago, casually, when I was in attendance upon a member of her family. She had then a most marked, and indeed hideous, deformity from the displacement of her

1879.]

right eyeball. Not being consulted about it, I never made any reference to it until early in March of this year, when she needed treatment on account of an attack of bronchitis. At this time I not only noticed that the protrusion of the ball was much greater than when I had last seen her (which was in July, 1877), but it was obvious that it was a source of constant annoyance and suffering. Upon asking her about it, she told me that in 1847—thirty-two years previously—she had had a severe confinement, and felt something give way about the eye. From that time there was a gradually increasing sense of swelling, and the globe began to be pressed downwards, subsequently coming forwards also. The protrusion had been growing much more rapidly of late. The pupil of the right eye was a full inch below that of the left.

The accompanying sketch, which she allowed me to make, may give some idea of the ghastliness of the deformity, which mortified her so much by the attention it attracted, that she had almost entirely ceased to leave the house.

Besides this, however, she was greatly annoyed by the frequent displacement of the upper lid, which would become engaged in the sulcus behind the globe, producing intense distress until replaced by manual effort. This obliged her to bandage the eye before going to sleep, either at night or by day. In order to read, she placed her hand over the affected eye, not only to hold the lids, but to shield it, and to aid her in disregarding the image on that retina.



Vision was still good, in spite of the change of shape induced by the pressure of the tumour, and the motions of the ball were free and normal.

On consultation with Dr. Thomson, who kindly saw her with me, I proposed to her to attempt the removal of the tumour, which could be readily felt as a dense semi-elastic mass below the supra-orbital ridge; and to this she readily consented.

Accordingly, on March 30th, in presence of Drs. Thomson, Harlan, and Schell, and Mr. Currie, medical student, she was etherized by Dr. Williamson, and I made an incision obliquely through the skin just below and parallel with the eyebrow. The tumour was very soon reached, and by means of the fingers and knife-handle enucleated. It seemed to have been attached only slightly, somewhere near the back part of the roof of the orbit. The wound was closed with fine silver-wire sutures, a small drainage tube being left at its outer angle; and a water dressing was applied.

For a few days she was much annoyed by a cough, which seemed to be a re-development of her previous bronchitis, perhaps the effect of the inhalation of ether. Some trouble was given also by eversion of the lower lid, kept up by spasm of the orbicularis muscle; but this was overcome by the careful application of a compress and adhesive plaster.

To-day, the forty-fifth since the operation, the eye is very nearly in its normal position, and follows the movements of its fellow accurately. Dr. Thomson has at my request examined the eye, and informs me that he finds it, corrected with a glass of 5 dioptries, to possess an acuity of vision of  $\frac{20}{L} = \frac{1}{2\frac{1}{2}}$ . There is slight astigmatism, which might be more closely corrected by a cylindrical glass. Vision is binocular. Hence it may be justly claimed that there is no loss of sight; and with suitable glasses she would now be able to read or work as she did thirty years ago. The wound has left very little scar; the greatly redundant skin in the upper lid has been much reduced by shrinkage, which process is still going on, so that she feels herself daily lifting the lid better and better.

The tumour, which was about the size of a hen's egg, flattened above and below, was submitted to Dr. Morris Longstreth for microscopic examination, and was found to be a spindle-celled sarcoma.

This case seems to me chiefly remarkable on account of the very slow growth of the tumour, the slight interference with the nutrition of the eye itself and of its appendages, and the ease with which it was enucleated. As to its origin, there is perhaps room for some doubt; it did not seem to be connected with the lachrymal gland, which I think was left untouched; and I would hazard the suggestion that it may have been developed from a blood-clot effused at the time of the severe confinement mentioned as having occurred in 1847.

Another point of interest is the complete restoration of the organ to its normal position, and the preservation of the movements in spite of the long and apparently extreme stretching to which the muscles and nerves had been subjected.

Two matters connected with the operation may be further referred to. One is the oblique mode of incision, by which the scar was rendered almost a mere hair-line. The other is the use of the drainage-tube, which prevented all risk of bagging of pus in the space left by the removal of the tumour.

The literature of the subject is so readily accessible that I content myself with simply placing this case upon record, without quoting the opinions or statements of others.

1924 Spruce Street, Philadelphia, May 14, 1879.

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### ARTICLE XIII.

CONTRIBUTIONS TO THE MINUTE ANATOMY OF THE LIVER.<sup>1</sup> By WILLIAM G. DAVIS, M.D., of Philadelphia.

IN investigating the anatomy of the liver, the proper injection of the vessels is a matter of the greatest importance. The principal vessels to

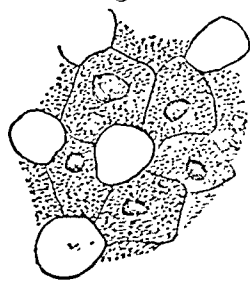
<sup>1</sup> Abstract of an Inaugural Thesis presented to the Medical Faculty of the University of Pennsylvania, and to which was awarded the Henry C. Lea Prize.

be injected are the venous, the arterial, and the biliary capillaries. In injecting any of these, the one fact constantly to be borne in mind is that the liver must always be kept warm and moist. Its surface should not be exposed to the air. To harden the specimen, Müller's fluid or alcohol may be used. The former is only to be employed with uninjected specimens or those injected solely with Prussian blue, as it destroys the colour of carmine. Specimens injected with carmine should be put into weak alcohol, to which a little acetic acid has been added. Specimens preserved in Müller's fluid may be transferred from it to a concentrated alcohol for a few hours before making sections. Specimens injected with nitrate of silver should be transferred to the freezing microtome, and sections made immediately. These sections should then be exposed to the light. The fluids used for injections are of two kinds—gelatine masses and cold flowing liquids. For the bloodvessels a solution of gelatine should be used. It may be coloured with carmine, Prussian blue, or chromate of lead. For the bile ducts, a watery solution of Prussian blue may be employed. The blue used in this case was a washing blue called "cream indigo."

To demonstrate the epithelium of the bloodvessels, the latter may be injected with .25 or .5 per cent. solution of nitrate of silver. This should be followed by an injection of warm water, and the liver then transferred to the freezing microtome. Liquids containing glycerine should be avoided, as it is impossible to harden the specimen either by freezing or with alcohol. For staining, Beale's carmine or hæmatoxylin may be used. The slightest trace of acid destroys the colour of the latter.

*Hepatic Cells.*—These are rounded in form, and lie embedded in the vascular and biliary capillary network. Their form is dependent on the amount of pressure in the bloodvessels. When the latter are empty, the cells are rounded; when they are distended, the cells where they touch each other are flat; where they touch the bloodvessels, they are notched (fig. 1). Excessive vascular distension causes the cells to appear as narrow bands of granular matter. They do not possess walls (contrary to Schmidt,<sup>1</sup> but in accord with Frey<sup>2</sup>). According to Pflüger,<sup>3</sup> they have walls which are continuous with the bile capillary walls. According to Kolatschewsky,<sup>4</sup> the substance of the cells is continuous with the same. This has not been observed, though carefully looked for.

Fig. 1.



Liver of Rabbit, showing cells modified by distension of the bloodvessels.

*Hepatic and Portal Veins.*—In injecting the venous capillaries, the

<sup>1</sup> Schmidt. Monthly Microscopical Journal, August, 1870.

<sup>2</sup> Frey. Microscope and Microscopical Technology. Amer. ed., 1872.

<sup>3</sup> Pflüger. Archives der Physiolog., 1869, 9 and 10 heft.

<sup>4</sup> Kolatschewsky. Schwalbe's Archiv für Mik. Anat., 1877.

hepatic vein should always be chosen. Injecting by the portal vein necessitates so much exposure of the organ that the injection at best can only be partial. The animal being etherized, an incision is made in the right lumbar region. The ascending cava is then ligated just beneath the edge of the ribs. The incision is then to be closed with two or three stitches. With a strong pair of scissors a large piece is cut out of the right thoracic walls. The hepatic vein (thoracic ascending cava) is now seen coming from the diaphragm. A spring clip should now be put on its diaphragmatic extremity, and a ligature on its cardiac extremity. This prevents the blood coming either from the liver or from the heart. The vein may now be nicked with the scissors, between the clip and ligature, and the canula inserted and tied therein. The injecting syringe being filled, the canula should be cleansed of clots by means of a wire. The clip is now removed, and, as the blood oozes out, the syringe is inserted and the piston pressed gently but rapidly home. The blood leaves the liver and collects in the intestines. The portal and hepatic veins are then ligated. If enough fluid is used, the intestines may also be injected at the same time. The object of ligating the abdominal cava is to prevent the fluid going to the lower extremities. In removing the organ, care should be taken to cut on the distal side of the ligatures.

*Hepatic Artery.*—As regards the distribution of the hepatic artery, Chrczonszczewsky,<sup>1</sup> Rindfleisch,<sup>2</sup> and Green<sup>3</sup> describe it as ending in the middle zone of the lobule, half way between the portal vein on the circumference and the hepatic in the centre. Beale,<sup>4</sup> Cohnheim und Litten,<sup>5</sup> and Kowalewsky<sup>6</sup> describe it as ending on the periphery of the lobule. We believe that this latter is the correct method, and its demonstration may be accomplished in the following manner: The animal being etherized, an incision is made in the right lumbar region, and the abdominal aorta and vena cava ligated; this may be done with a single thread. The thorax is then opened and a clip placed on the hepatic vein. A canula is then inserted into the thoracic aorta and a cold flowing blue mass thrown downwards. After two or three syringefuls the vessel is ligated. A canula is now inserted in the hepatic vein, and a red gelatine mass injected downwards. As the red liquid flows into the vein, it meets the blue from the artery and washes it out the portal vein. The blue liquid then remains in those capillaries only which are purely arterial, being kept from regurgitating by the ligature on the aorta. The organ may then be

<sup>1</sup> Chrczonszczewsky. Quoted by Cohnheim und Litten. Virchow's Archiv, 1876, pp. 156-165.

<sup>2</sup> Rindfleisch. Pathological Histology.

<sup>3</sup> Green, J. Henry, M.D. Introduc. to Path. and Morbid Anat., 1876.

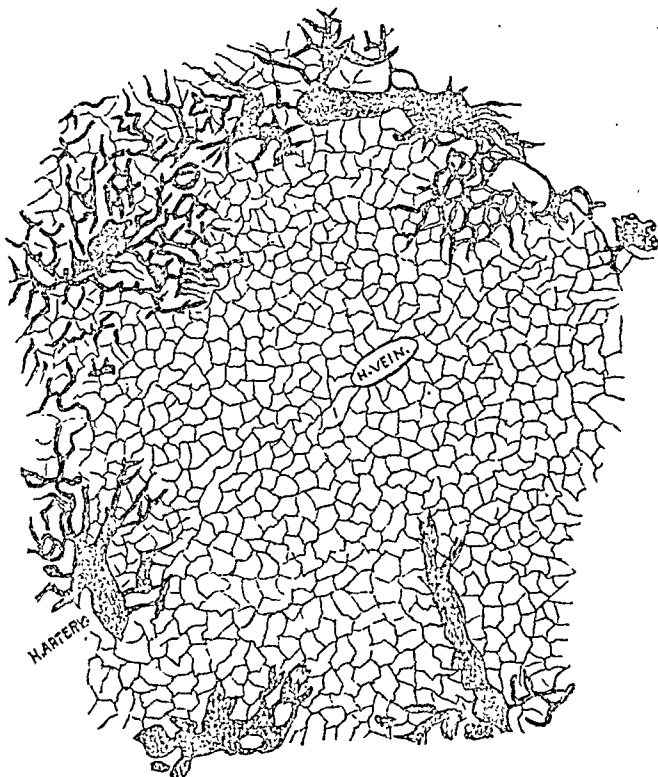
<sup>4</sup> Beale. How to Work with the Microscope, p. 140.

<sup>5</sup> Cohnheim und Litten. Virchow's Archives, bd. 67, 1876.

<sup>6</sup> Kowalewsky. Protocols of the meetings of the Russian Natural Scientists and Physicians, 1876.

removed as before described. In a preparation made in this manner, the artery is seen breaking into capillaries on the border of the lobule and anastomosing with the vein. With Schmidt we have failed to see any branches distributed to the capsule. (See fig. 2.)

Fig. 2.



Liver of cat. The artery is seen on the edge of the lobule breaking into capillaries; these empty immediately into the capillaries which unite to form the hepatic vein.

*Hepatic Duct.*—In studying the distribution of the duct, it is desirable to have the bloodvessels injected. This may be done as detailed for the portal and hepatic veins. The large vessels being ligated, the liver is to be removed to a capsule of warm water. The ductus communis choledochus should be tied and a canula inserted into the gall bladder. This is just as efficient and easier than to insert it into the duct. The organ may now be injected either with the syringe, or by means of a constant pressure of a column of liquid, or by means of atmospheric pressure. In this last method the capsule containing the liver immersed in warm water is placed on the plate of an air pump. A tube passes from the canula in the gall bladder through an air-tight cork in the top of the bell glass, by which the capsule is covered. The distal end of this tube is immersed in the injecting fluid. A clamp is placed on the tube outside of the bell glass. The air is then to be exhausted. The clamp being very gradually loosened, the liquid flows into the liver; and it should be loosened only

enough to allow the gall bladder to be moderately distended. If the clamp is opened suddenly, the gall bladder will burst or extravasations will occur.

*Triple Injections* may be made by injecting the veins and artery as described under the hepatic artery, and the duct by one of the methods just described. Concerning the exact method of termination of the bile ducts, there is much dispute. Beale<sup>1</sup> still adheres to the tubular structure theory, and regards the bile capillaries as the result of a forced injection. Hering<sup>2</sup> and his followers believe that the bile capillaries exist already as fine channels. Schmidt,<sup>3</sup> Budge,<sup>4</sup> and others hold that the bile capillaries are a distinct system of vessels with walls of their own. Legros,<sup>5</sup> going still further, claims to have demonstrated, by injection of nitrate of silver, the existence of epithelium in the finest bile capillaries. The vastness of this claim is such that we hope we may be pardoned for acknowledging our inability to take it all in. The view of Schmidt and Budge, which describes bile capillaries with true walls, is the one which we think correct. In fig. 3

Fig. 3.



Scale. \_\_\_\_\_  
2.602 inch.

Rabbit's liver. Bile ducts injected. *a.* Capillary bile ducts forming angular spaces in which are inclosed the hepatic cells *b.* Some of the cells have two nuclei.

are seen injected bile capillaries.

The spaces are as large as an hepatic cell and *angular* in outline. If they were produced by a forced injection, the liquid would follow exactly the contour of the cells and make round spaces, the capillaries at points of junction being then much larger than between such points. When the liquid came in contact with a bloodvessel, it would surround the vessel and make a curved capillary, but curved capillaries are comparatively rare.

If we were able to trace a natural communication between the capillaries and larger bile ducts,

it would aid in the consideration of the subject very much. Prof. Beale, referring to this in his last paper, asks why it has not been shown. He says Hering's drawings do not exhibit it, and therefore he denies its existence. We have the good fortune to be able to produce this missing link.

<sup>1</sup> Beale. Archives of Medicine, 1872.

<sup>2</sup> Hering. Stricker's Manual of Histology.

<sup>3</sup> Schmidt. American Journ. of Med. Sciences, January, 1859.

<sup>4</sup> Budge. Archiv. für Anatomie und Physiologie, 1859, p. 463.

<sup>5</sup> Legros. Sur la struct. et l'épith. propre des canaux sécréteurs de la Bile. Journal de l'Anat. et de la Phys. de l'Homme et des An. 1874.

In fig. 4 is seen a longitudinal section of a large bile duct, with its characteristic epithelium and also its blue injection fluid. At b, c, and d it breaks up into capillaries. The capillaries at b are shown increased in size in fig. 5. Each mesh contains usually one hepatic cell. Two nuclei

Fig. 4.

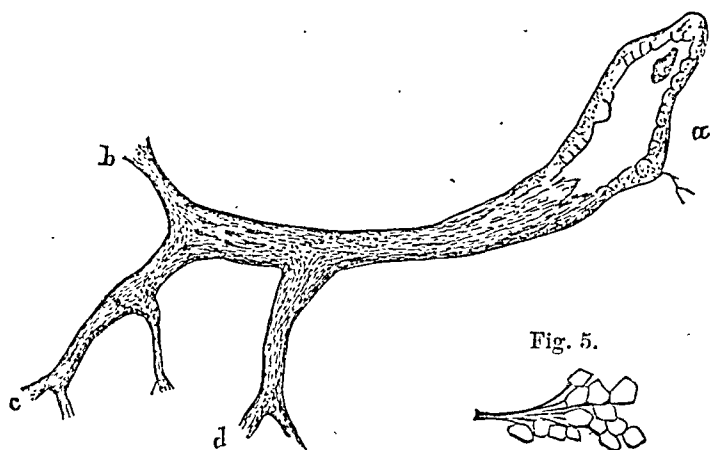


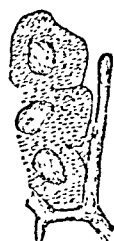
Fig. 5.

Longitudinal section of a bile-duct; cat's liver. At a is seen the epithelium; at b, c, and d, the duct is breaking into capillaries.

The lower figure shows the capillaries at b more highly magnified.

in a mesh may belong to a single cell. The diameter of the capillaries varies with the amount of contained liquid, but is usually from  $\frac{1}{14000}$  to  $\frac{1}{8000}$  in. in diameter. The former is the more common size. In support of the existence of true walls, we would say that the injection in a capillary has been seen to cease and the capillary continued by a colourless line. This latter is supposed to be the collapsed and empty capillary walls. The angularity of the spaces and the distinct limitation of the capillaries also favours this view. The injected capillaries are sometimes seen to project beyond the edge of the cells, and also at times clinging to their free sides. This is seen in fig. 6. This appearance would be impossible with no true walls. They are known to be bile capillaries by their very small size, and by being continuous with a biliary network. When the pressure has been great, the bile capillaries, instead of being straight, as is natural, are convoluted and tortuous. This would only occur in a tube with true walls. Concerning the relation of the blood to the bile capillaries, we consider, with McGillivray, that it is a matter of accident whether they touch or not. Sometimes they lay along-side of one another, and sometimes

Fig. 6.



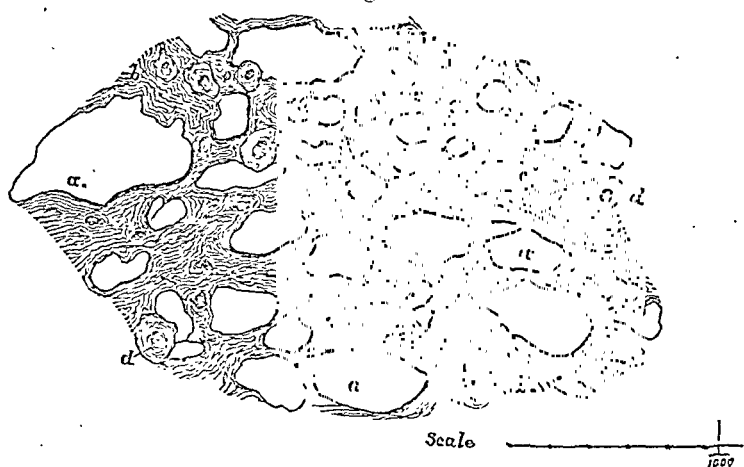
Rabbit's liver. A capillary bile duct is here seen clinging to the free side of three hepatic cells. Injected with a watery solution of Prussian blue.



they cross over each other. This is contrary to Hering,<sup>1</sup> Peszke,<sup>2</sup> and Orth.<sup>3</sup> We do not accept the view of Schmidt that there exists a natural communication between the lymphatics and bile capillaries. The return of the injection fluid by the lymph canals can be accounted for by extravasations into the lymph spaces. This latter we believe we have seen in one instance. The blunt extremities of bile capillaries described by Eberth have been noted, but they are probably due to a cessation of the injecting fluid, and not of the capillary itself.

*Connective Tissue.*—To demonstrate the intralobular connective tissue, a piece of child's (or adult's) liver, which has been preserved in Müller's fluid, may be used. When a section is made and brushed, a connective-tissue-like network is left. This is not true connective tissue, but consists almost entirely of bloodvessels, as can readily be proven by the remains of blood corpuscles seen within them. The only true connective tissue present consists of fine fibrils which pass from one bloodvessel to another, and also those which adhere to the walls of the vessels. Both are very scanty in quantity. (See fig. 7.) There is no basement membrane of any sort

Fig. 7.



Liver of a child: cells removed by brushing.—a. spaces left by removal of the cells; b. bloodvessels; c. connective tissue fibrils crossing from one vessel to another; d. hepatic cells.

existing between the hepatic cells and the walls of the bloodvessels. What Frey in his work gives as the framework substance of the liver, and calling it a "homogeneous membrane with nuclei," is in reality bloodvessels. Fleischl<sup>4</sup> has also, we believe, mistaken the bloodvessels for connective tissue.

<sup>1</sup> Loc. cit.

<sup>2</sup> Peszke. Beiträge zur kenntniss des feinern baues der wirbelthier leber. Dissert, Dorpat, 1874.

<sup>3</sup> Orth. Cursus der Normalen Histologie. Berlin, 1878.

<sup>4</sup> Fleischl. Ber. d. Königl. ges. d. wiss. 1874, tafel I.

*Lymphatics.*—An attempt was made to demonstrate these by means of a method suggested to me by Dr. E. O. Shakespeare. The abdomen of an etherized animal was opened and a stick of diluted nitrate of silver rubbed over the surface of the liver. In a half an hour the animal was killed and sections made with the freezing microtome. In the two experiments made in this manner, the peritoneal surface was coloured with the nitrate of silver, but there were no lines going inward to indicate the course of the deep lymphatics.

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#### ARTICLE XIV.

SANITARY DRAINAGE. By M. CAREY LEA, Esq., of Philadelphia.

It is only of late years that attention has begun to be intelligently directed to the dangers which we have introduced into our houses together with the "modern conveniences." The investigation of the subject has revealed both ignorance and recklessness—ignorance of the laws which govern the movements of mixed liquids and gases in more or less confined tubes, and recklessness in introducing fixtures connected with sewers and imperfectly protected from sewer gas into confined spaces adjoining sleeping rooms, and connected with them. The results have been such as to make it evident that there exists a pressing need for a wide diffusion of knowledge on the subject of drainage, especially amongst medical men, in order that they may insist on a radical change in certain of the methods now in use. For want of this reform, it is no exaggeration to say that not a house in a hundred in any of our large cities is properly protected from sewer gas.

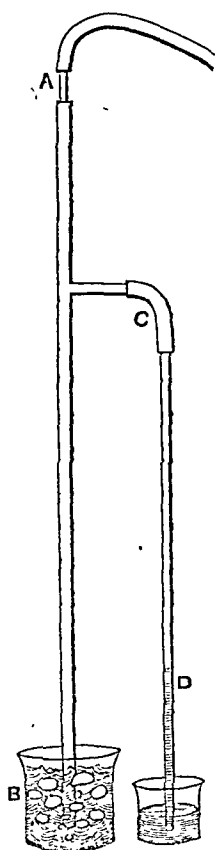
*Soil Pipes and Traps.*—To correctly understand the workings of our most common arrangements for drainage, it is desirable to obtain an insight into the nature of the movements of currents of water and air mixed in tubes.

Over the pipe of a water faucet let us attach a few feet of rubber tube, and insert in the other end of the rubber tube a glass tube as thick as a quill, and two or three inches long. Let another glass tube of half an inch internal diameter and three or four feet long be held vertically in a glass beaker. If now we insert the small glass tube into the upper end of the vertical tube, and turn on water, we shall find that the water in descending carries with it a great quantity of air, which becomes entangled in the descending current, and rises tumultuously in bubbles in the beaker.<sup>1</sup>

<sup>1</sup> The principle here involved is used on a great scale in Catalonia for providing an air blast for furnaces. Mountain streams are conducted over steep cliffs and into large pipes, too large to be filled by the stream, which in descending produces a powerful and steady blast of air.

If we now insert a small horizontal tube into the side of the larger, a few inches from the top, we shall find that a powerful *suction* is exerted through the horizontal tube, which may be rendered evident by applying a taper, or, still better, by attaching a glass tube by a short tube of rubber, and plunging the lower end of the tube in water. The extent to which the water rises will mark the amount of suction exerted. For many years past I have used both these forms of action in my laboratory, the one for driving blowpipes, the other for aspirating. For both purposes the results are most excellent.

Fig. 1.



In the upper end, *A*, of a tin tube is loosely inserted a glass tube of much smaller diameter, connected by a rubber pipe with a water faucet. On admitting a stream of water through the small tube at *A*, great quantities of air are carried down into the beaker *B*, together with the water.

If a small tube *C* is inserted into the side of the vertical tube, a powerful suction is found to be exerted in it, which may be measured by attaching a rubber connection to a glass tube plunged in water. The height, *D*, to which the water rises measures the amount of suction exerted.

The principles involved in the above experiments will explain the most complicated actions which take place in soil pipes and water-closet traps. The action of the discharge water in a soil pipe is precisely similar to what takes place in the pipe *A B*, and the aspiration or suction through *C* is exactly what occurs in traps attached laterally to the soil pipe.

The most common form of arrangement in houses built within the last generation is to have a bath and water-closet on the second story, and the same on the third, immediately over those on the second story, and using the same soil pipe. Older houses have been mostly altered to correspond more or less with the above mentioned arrangement. Wash-basins with water-faucets are very variously distributed, but connect by longer or shorter waste pipes with the soil pipes at or about the same places where the bath and water-closet discharge. I shall, therefore, as a general form, consider the case where a bath, closet, and basin are placed in a second story room, with a similar arrangement in the story above, all served by one soil pipe, terminating just above the third story attachments, and connected to it through separate traps. If the bath is connected to the water-closet trap, as is most commonly done, I shall suppose the precaution

taken (which, although essential, is generally neglected) of having a trap between the bath and the water-closet trap.

Experience has shown that in such an arrangement it happens that when one of the larger fixtures is used, that is, either bath or either water-closet, it follows that one or more traps are sucked out, and free access allowed for sewer gas to enter the house, and this, not as an exception, but rather as the rule.

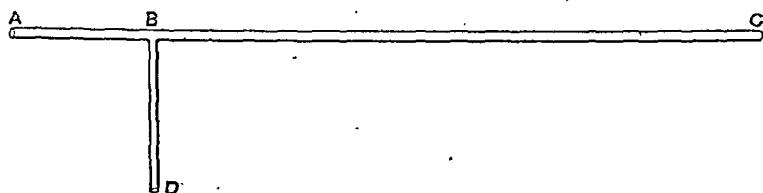
On examination we perceive that this evil comes in a variety of different ways, to wit:—

1. The use of a lower fixture may suck out an upper trap.
2. The use of an upper fixture may suck out a lower trap.
3. The use of any fixture may suck out another trap on same level; and lastly,
4. The using of any fixture may result in *its own* trap being sucked out. (These distinctions are important because the remedies are different.)

*The first capital improvement* introduced into drainage was the carrying of the soil pipe of full size to and above the roof. This is indeed the foundation stone of all good plumbing. By itself, and without other aid, it cures *two* of the above cases, the first and third, and it also renders possible the curing of the other two, with the aid of other arrangements.

CASE 1. The simple carrying of the soil pipe to the roof, without diminution of size, may be said to cure Case No. 1, at least where the soil pipe has been given a full diameter in proportion to its length. The importance of a full size has, I think, not been sufficiently insisted on. The principle on which it depends, will be understood by the following experiment:—

Fig. 2.



A tube,  $A B C$ , has one of a little smaller size,  $B D$ , inserted at right angles. Over the end  $A$  is to be passed a rubber tube. In a flat-bottomed vessel some strongly coloured liquid is to be poured to the depth of an eighth of an inch. Into this the extremity of the tube  $B D$  is plunged. If now, the end  $C$  being freely open, we apply a gentle and steady suction at  $A$ , by means of the rubber tube, the air in  $B D$  is not disturbed, nor does the liquid rise in it. But if a sudden suction is applied, the liquid rises in  $B D$  for a moment, and, by its colour, leaves a mark on the tube to show the height to which it rose. In order to get some rough numerical data, it was found that when  $B C$  was  $\frac{1}{8}$  inch diameter and 34 inches long, a tolerable suction raised the liquid in  $B D$  1 inch, and a strong suction  $1\frac{1}{2}$  inches. In this case the length of the tube  $B C$  was 170

diameters, and might be said to roughly correspond with a soil pipe having a diameter of 4 inches and length of 57 feet. Comparisons of this sort are however, to a large extent, illusory, and the experiment must be taken simply as illustrating the principle and indicating the danger.

The action in the soil pipe is precisely of the same nature. If the water from the emptying of a fixture descended slowly and regularly, no influence whatever would be exerted on the lateral trap in the story above, because of the slight friction of gases in moving through tubes.<sup>1</sup> But the sudden descent of a body of water by the emptying of a water-closet or bath, creates a suction similar to that shown in the experiment just described; and although the suction is but momentary, that moment is sufficient to empty a trap, which has rarely more than 2 or 3 inches seal. To prevent the upper trap from being emptied, we must make the entrance of air through the top of the soil pipe as easy as possible. Any contraction, therefore, of the pipe is most strongly to be objected to. The placing of a strainer or grating over the end is to be entirely condemned. There must be nothing to interfere in the smallest degree with the freest possible entrance of air at the top, to relieve the suction and save the traps. With a closed soil pipe, such as even at this time is very generally used, *this emptying takes place with the utmost facility*, and may be said to be the rule rather than the exception.

CASE 2. Even with an open soil pipe, the use of any upper fixture, especially one using as much water as a water-closet or bath, may and does suck out any trap on a lower level.

The manner in which this takes place is exemplified at Fig. 1. The lateral suction caused by a descending current of water in a pipe easily empties a trap.

The remedy for this lies in *ventilating the trap*. (This expression, which has passed into general use, tends to create a false impression; the object is not to purify the air in the trap, but, by providing for the free admission of air, to prevent emptying by suction.)

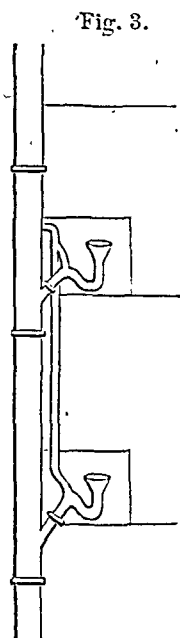
A pipe of sufficient diameter to admit of air freely (see Figs. 3 and 4) is attached at the upper side of the trap nearest the soil pipe. This pipe is carried upward parallel with soil pipe, and connected with it at a point *fairly above every other connection whatever that is made with the soil pipe*. This last point cannot be too strongly insisted upon. To attempt to ventilate a second story trap by a pipe that connects with the soil pipe *under the third story attachments* is absolutely useless. One ventilating pipe, however,<sup>2</sup> will answer for a whole series of water-closets

<sup>1</sup> The experience of gas manufacturing shows that a single inch difference of water-level will drive gas thousands of feet through gas mains.

<sup>2</sup> In the most modern system of English plumbing the ventilating pipe leaves the soil pipe at its trap into the drain; two or three feet beyond it is carried *into the soil pipe*, and rises through the centre of the latter to the roof, where it is carried out

or other fixtures. It should not be of too small diameter, though it is quite unnecessary in my opinion that, as sometimes alleged by good authorities, the ventilating pipe should have the same diameter as the trap which it ventilates. The friction of air in pipes, as above pointed out, is very small, and the admission free. Something will of course depend upon the number of stories on which fixtures are placed, and the number of water-closets and baths. For the common arrangement of a bath and closet on each of two stories, a ventilating pipe of two inches internal diameter should, I think, be held sufficient, if not narrowed at its connections by bad plumbing. Additional size, however, can never be a disadvantage.

CASE 3. When the common closed soil pipe is employed, the use of any fixture may cause suction enough in the soil pipe to empty the trap of another on the same level. But the open soil pipe cures this as well as Case 1; because the suction in the soil pipe takes place *below* the point at which the water enters, and therefore other fixtures which enter the soil pipe on same level are relieved by the air entering the open end of the soil pipe. (But if two fixtures on the same floor tap the soil pipe, the one below the other, the use of the upper fixture may suck out the lower. The ventilating pipe avoids this danger.)



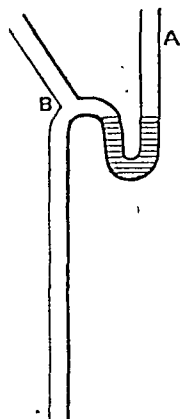
CASE 4. The case of a fixture sucking out its own trap might, at first sight, seem to depend on the same conditions as Case 3; but this is far from being so. A fixture may suck or siphon itself out even with an open soil pipe.

Fig. 4 represents an ordinary S-trap terminating in a vertical pipe. If water trickles only into the upper opening *A*, it will escape by the lower, and leave the trap full. But if the current of water is enough to fill the tube, then, when it is stopped, the water in the lower branch will siphon the trap out. Even if the water does not fill the tube sufficiently to siphon it out, it may by entangling air, in the manner already described, produce a suction sufficient to empty the trap.<sup>1</sup> The remedy lies as before in Case

again. The ventilating pipes of the several traps pass through the soil pipe into the interior ventilating pipe. Those who may wish to examine further into this method will find it illustrated with excellent diagrams in the "Plumber and Sanitary Houses," by Hellyer, London, 1877. But the soil pipe thus partly filled up would seem to be easily choked or stopped up by substances improperly thrown into water closets by servants.

<sup>1</sup> It is believed that the emptying of traps by suction, created by the joint action of air and water in the pipes, on the principle of the Catalonian Blast, is here explained for the first time. This emptying has always hitherto been explained on the principle of the siphon. No doubt siphoning, correctly so called, may occasionally take place, but for this the quantity of water descending must, in the vast majority of cases, be altogether insufficient, especially in the case of soil pipes, the most ordinary one. To

Fig. 4.



2, in ventilating the trap by introducing a tube at *B*, through which air can enter, as shown in Figs. 3 and 4.

We see, therefore, that these two capital improvements, the *carrying of the soil pipe above the roof* and the *ventilation of traps*, are sufficient to remove all danger of the introduction of sewer gas by the removal of the water seal of traps.

Before leaving this part of the subject one remark remains to be made. In the case of the small S-traps used for the waste pipes of wash basins, the orifice at *B*, figure 4, of the ventilating pipe is liable to be sometimes filled up by grease from soap. *The trap can then be siphoned out*, and sewer-gas be admitted (provided the sewer traps are not arranged as hereafter to be described). For this

reason, instead of ventilating the basin traps, I prefer to use Bowers's traps. It is proper to say, however, that good authorities differ on this point. All bottle traps are liable to form collections of grease in the glass reservoir, finally stopping their action. But this trouble makes itself quickly evident; the basin will not empty. The remedy does not even need a plumber to apply it; anyone can unscrew the glass reservoir, empty, and replace it. But if the orifice *B* of the S-trap is stopped, it may not attract attention. Foul smells may be perceived, but the cause is not at once evident.

*Sewer Connections.*—Until very lately it has been universally considered that when a trap was interposed at the connection of the drain with the street sewer, all had been done that the most exacting could require. Experience has taught the contrary.

A sewer is an opening of immense length as compared with its breadth. The breadth is confined to a few feet, the length may extend for miles. When heavy rains take place a powerful current passes through, and the result may be either an expansive force or one of suction. The water in the river or bay that serves as outlet may or may not cover the mouth of the sewer, depending in some cases on tides, or, in the case of inland rivers, on the high or low water at different periods of the year. When the mouth is covered by water, a material obstacle is placed against the exit of the drainage.<sup>1</sup> A powerful expansive force results in the sewer, which must often be far more than sufficient to force the few inches of water seal in the traps along its course.

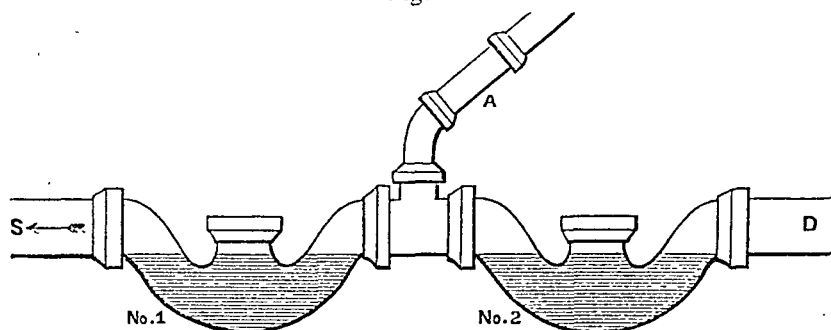
When the mouth of the sewer is uncovered, and perfectly free passage produce a siphoning action the longer leg must be full of water. The least consideration will show that this can never take place in an ordinary soil pipe by the emptying of either a water-closet or a bath.

<sup>1</sup> In Philadelphia instances have come to my knowledge where a heavy rain has completely filled a sewer to the top, for a distance of half a mile or over, back from the Delaware.

for its contents afforded, the action is reversed, and a force of suction ensues. This force seems to be generated somewhat in the same manner as in the case of vertical tubes already described. It is sufficient that impediments, sharp turns and the like, should at any point dash the water about so as momentarily to fill the whole section of the sewer. This suction empties the traps along the line of the sewer, and leaves free passage for sewer-gas when the sewer returns to its normal condition by the cessation of the rain.<sup>1</sup> Expansion and contraction may also arise from simple changes of temperature, and in the absence of rain.

Both these evils, of suction and of forcing, are cured by a single ingenious arrangement; that of placing two traps instead of one at the sewer attachment, with a ventilating pipe between.

Fig. 5.



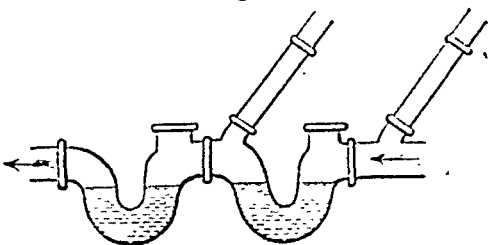
In this figure, *S* indicates the direction of the street sewer, *D* shows the end of the house drain. The ventilating pipe, *A*, is conducted to the pavement, or, better, into a kitchen flue, in the manner to be presently described.

Between the drain and the sewer are interposed two traps,<sup>2</sup> Nos. 1 and

<sup>1</sup> The same cause, the rain, which may tend to make a sewer suck out a trap, naturally tends also to refill the trap by the surface drainage of the house. So that, in a heavy rain, it may happen that a trap is many times sucked out and refilled. The question arises, Which action will continue longest; will the trap finally be left full or empty? The answer, I think, is, *empty*, for the sewer drains a much larger area than that of any one house, and the rush of water must continue in it after it has ceased in the house drain.

<sup>2</sup> The traps which I have shown in the above figure are of the shape usually employed in Philadelphia, and have the cleaning hole in the centre. Fig. 6 shows another form, narrower and deeper, with the cleaning hole at the top of one of the branches. It is unimportant which shape is used, provided the trap is well made. Some have the fatal defect that the depression is not sufficient to cut off the air passage, and consequently affords no protection whatever.

Fig. 6.





2. If there is a suction in the sewer, and trap No. 1 is sucked out, air rushes in through the ventilating pipe and relieves the suction. Trap No. 2 remains unaffected. If there is an expansive force in the sewer, and gas is blown through trap No. 1, it passes off through the ventilating pipe. For the reasons already given, it *cannot* force the second trap when the ventilating pipe is open. So that, under any circumstances of suction or pressure, trap No. 2 remains in working order and protects everything behind it.

It might be asked, why not omit trap No. 1 altogether, inasmuch as it is the ventilating pipe, and not trap No. 1 that secures trap No. 2. It is perfectly true that trap No. 1 does not even aid in preserving trap No. 2; that is not its function. But it is not desirable that the ventilating pipe should at all times allow free escape for gases from the sewer. The function of trap No. 1 is to prevent this, and admit of the escape of gases through the ventilating pipe only under extraordinary circumstances.

As to the disposition to be made of the ventilating pipe, there exists a difference of opinion. Some advise to carry it to the pavement, others to bring it into the kitchen flue. In my opinion neither of these plans is desirable. The proper course is to carry it into the kitchen flue, and to continue the pipe up to and above the top of the chimney.

With these precautions the drainage of a house may be considered safe, with one exception, that the house drains themselves should be ventilated.

*Ventilation of House Drains.*—The arrangements already described for ventilating inside traps do not ventilate the drains themselves; nor does the ventilating pipe just above described. Their functions are limited to preventing the sucking or forcing of the traps to which they are attached. By the ventilation of drains is intended something quite different, viz., the establishment of a current of air through the drain pipes to prevent the collection of foul gases in them.

The necessity for such ventilation varies very much in different cases, and in this respect differs wholly from the foregoing precautions, which must be considered as indispensable in any case. A small house, the drainage of which is carried by a short pipe having considerable pitch directly into a sewer within a few feet of the house, may possibly not need to have its drains ventilated otherwise than as previously described. As the size of the house increases, and with its size the complexity of its drainage, the need of ventilation rapidly augments. Of late years it has been customary to build rows of houses with a drain pipe running in the rear, and making one connection only with the sewer for the whole row. At the present day it is probable that more houses are built in this way than with separate sewer connections. In such rows the main drain forms almost a small sewer in itself, and it and the whole system of pipes connecting with it should be ventilated. To a certain extent this result is unintentionally effected by the rain-water pipes, which tend to act as flues.

But the upper ends of these pipes are almost always in close proximity to windows; those of back buildings to the higher story of front buildings, those of bay windows to the windows above, and in the very common case of mansard roofs the openings of the main-building rain-water pipes are close to the mansard windows. Consequently foul odours enter the windows in summer. To cure this evil, traps are probably put to the rain-water pipes, and thus the drain is corked up and ventilation stopped.

In the few cases where any express ventilation of drain-pipes has been attempted, it has been done by cutting openings into kitchen flues, and establishing a connection between the drains and the flue. This has always seemed to me a very dangerous proceeding. It is true that when the fire is allowed to go out in summer nights, it is *probable* that heat enough will remain till morning in the stack to maintain an upward current, but this is a poor dependence. When, however, the house is shut up for a period, this heat in the stack quickly disappears, and then the kitchen flue is precisely like any other opening. The house being closed up, all expansions and contractions must chiefly regulate themselves through the flues. Every change of temperature, and every barometric change, starts a current up or down the flues, and as often down as up. When the current is downward, the drain is freely ventilated into the house. Let anyone consider then, what condition a house is likely to present in the autumn which throughout an entire summer has had, during one-half of each day on an average, sewer gas freely poured into it.

How then shall the advantage of artificial ventilation be attained without this danger? In place of carrying the connection simply to the kitchen flue, let it be carried by a stout iron pipe *to and above the top*.

This admirable plan, though mentioned in some of our latest text-books, has so far been but little adopted. The architect or the owner is too apt to think that when a pipe has been carried to the kitchen flue, all has been done that is required, and the device in this form has long been a favourite one; the danger which arises from a temporary closing of the house is almost invariably overlooked or disregarded.

Carrying the pipe to the top of the chimney has every advantage on its side. Not only is the danger of escape into the house completely got rid of, but it is evident that the draft in the ventilating pipe must be greatly increased. For the pipe over the whole length is heated, and the lower part very considerably. A column of well-heated air, thirty or forty feet in length, must always give rise to a far more powerful draught than the comparatively slight force of suction produced by the draught of a chimney upon a lateral opening. Yet, as already said, this latter plan, although capable of little good and much mischief, is largely used, and the better method almost unknown. Probably this is in part owing to the very recent introduction of the better method, and in part to persons being unaware that the latter can be introduced without serious difficulty into

houses already built. As to this, the writer can speak from experience, having caused it to be introduced into chimneys in a row of houses on Broad Street, above Montgomery Avenue, in the city of Philadelphia, of which he directed the construction. After applying all the improved methods detailed in the course of this paper, it was concluded that the system would not be complete without a special plan for artificial ventilation of the whole system of drain pipes, soil pipes, and rain conductors. At the time when this decision was reached, the kitchen chimneys were already built. It was not, therefore, practicable to raise the iron pipe in sections along with the chimney; the much more serious problem presented itself of introducing a pipe into chimneys already built, and between thirty and forty feet in height. This was, however, found to be practicable. The plan adopted was to put a derrick on the roof, lower the pipe in sections, screwing each into the previous. The lowest section was bent horizontally at bottom. A hole was cut into the kitchen flue just over the range, the hand passed in, and when the lowered pipe came opposite it was seized and drawn through, and secured to the lower exterior portion. To render the return of any gas absolutely impossible, the following arrangement was made. On the top of the chimney a flat cap-stone was laid, with openings underneath for escape of smoke. The ventilation pipe was carried through a hole cut in the cap-stone, and continued six inches or more higher. A connection of this kind at both ends of the row and at several intermediate points must establish in each case a powerful upward current, and produce a slight exhaustion in the main drain, supplied by liberal currents of fresh air entering through rain water pipes and down soil pipes (with open ends above the roof), thus keeping the air in the drains constantly fresh, and dispersing the gases where they can do no harm.

These details have been thought worth mentioning here; partly, because they show the practicability of introducing a really effective drain ventilation into a house already built, and partly because they indicate an improved method of arrangement; it is believed that the plan of putting the ventilating pipe through the cap-stone, whilst the smoke flue ends below it, has not previously been described.

I have been asked, before concluding this paper, to discuss more particularly the result likely to follow an attempt to improve the sanitary condition of a house by connecting the drain with the kitchen flue, in the manner commonly practised and already condemned. The occupant of a house becomes solicitous about his drainage, and asks a plumber what can be done to render it safe, in a simple way. The plumber advises to attach a ventilating pipe to the lower part of the drain, and carry it to the kitchen flue, and recommends the plan as being cheap and effective.

As this mode of improving drainage has received a large acceptance, it seems worth while to study its results; and the first point that attracts

our attention is that, as respects the siphoning out of traps on the stories above, the great difficulty of modern plumbing, *it cannot exercise the slightest influence.*

To understand what influence it does exert, it is necessary to know whether or not an effective trap exists on the main drain. If there is no such trap, then the ventilation pipe simply ventilates the *street sewer* into the house. As long as there exists an upward draught in the kitchen flue, no evil result may be felt, but as soon as this ceases to exist, the house must be filled with sewer-gas, to a horrible extent, from the absolutely free communication afforded.

If, on the other hand, there exists a trap on the main drain in working order, the result will be different according as the plumber attaches his ventilating pipe on the sewer side or the house side of this trap.

If *on the sewer side*, the ventilating pipe will have the useful effect of preventing the trap from being either forced or sucked out by expansions or contractions in the street sewer. But this useful effect will be much more than counterbalanced by the house being placed in free connection with the street sewer, except as protected by the draught in the kitchen flue.

If the ventilating pipe is inserted *on the house side* of the trap, then the house will be defended against the sewer by both the draught in the kitchen flue and the trap. But in this arrangement the trap itself is no longer defended by the ventilating pipe, and is liable to be sucked or forced by the street sewer. If the trap is sucked out, then, as long as it remains in that condition, there is a free communication between the house and the street sewer, precisely as if there were no trap.

It is therefore to be concluded that this mode of ventilation is at best but a poor expedient. The most important object of all, the protection of the upper traps, it does not in the least effect. What of good it accomplishes in drawing off foul air from the pipes, is largely counterbalanced by the dangers it brings in case of closing up the house. And when sewer poison is thus introduced, it is quite impossible to say how long traces of it may remain in spite of the most careful ventilation. The sense of smell can give no information as to this point. It should be understood that when this arrangement is used, it is of vital necessity to provide a good S trap between the point at which the flue-pipe is connected with the drain and the street sewer. But the whole arrangement, even at its best, cannot be approved or sanctioned, and should be entirely abandoned. It is even probable, that whoever first introduced this expedient, had no clear idea of what he expected to effect by it, but had merely a vague notion of conducting foul vapours into the kitchen chimney; and those who now recommend it, do so simply because it has become a recognized form of proceeding which it is easier to adopt than to examine and study out. Such expedients might be excusable if the right methods

were not simple and practicable. These have been here already fully described, but may be briefly recapitulated: 1. Let the soil pipe be carried of full size and wholly unobstructed to and above the roof; *nothing* can take the place of this. 2. Let every water-closet trap be ventilated; every bath trap also, if it separately connects with the soil pipe; and let every wash-basin have a good bottle trap. 3. Let there be two good S traps, with ventilation pipe interposed (see Fig. 4) between the house and the street sewer. In this, and in no other way, can a house be made safe.

If space permitted, I should have wished to say something on the subject of the *selection of water-closets*. I must, however, limit myself to recommending the rejection of the old-fashioned "pan-closets," and the use of a good form of valve-closet in which there is no tilting pan. Forms of water-closet advertised as "requiring no trap," should either be avoided, or have a trap attached.

Finally, it may be said that in view of the vast amount of preventable mortality that arises from defective drainage, it is greatly to be desired that public opinion should be educated to the point of requiring from architects and builders a stricter compliance with the laws of sanitary engineering, and it is probable that much good might result from the passage of city ordinances compelling attention to some of the most vital points. Thus an ordinance requiring that every soil pipe should be continued of full size to and above the roof, and not be allowed to serve as a rain conductor; and that no drain should be allowed to make connection with the sewer without at least one well constructed trap, or better with two, as here described, would be of vast utility in improving the health of the poorer classes. Those who can afford better habitations, and who can think and judge for themselves, should insist on all the precautions briefly explained in this paper, as the indispensable conditions for preserving health.

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#### ARTICLE XV.

GUNSHOT WOUND THROUGH BOTH HEMISPHERES OF THE BRAIN; RETENTION OF BULLET IN THE CRANIAL CAVITY; CONVULSIONS, RECOVERY, WITH PERSISTENCE OF ALL THE CEREBRAL FUNCTIONS. By P. F. HARVEY, M.D., Captain and Assistant Surgeon, U.S.A.

ON the night of November 18, 1878, at half-past nine o'clock, a letter was handed me by a courier from Poplar River, M. T., announcing the accidental wounding of Dr. G. A. S., Agency Physician of the Indian Agency situated at that place, sixty-five miles distant, and requesting my attendance as soon as possible. The letter was from Dr. W. Bird, the agent in charge, and stated, *inter alia*, that Dr. S. had received a wound in the

head that morning by what appeared to be a wandering rifle ball. I started at midnight, and availing myself of a relay which by good fortune I found at a half-way ranch, succeeded in reaching Poplar River at 10 o'clock A.M. the next day. I found Dr. S. suffering, as reported, from a gunshot wound of the brain, the ball having entered at a point  $3\frac{1}{4}$  inches above, and 1 inch behind, the right meatus auditorius externus,<sup>1</sup> and ranged across through the cerebral lobes in a transverse direction towards the left supra-orbital convolution, as demonstrated by probing along the track of the wound which had been practised twice to the depth of five inches previous to my arrival. The missile which caused the injury, as definitely as I could ascertain, was a Winchester rifle ball of forty-four one hundredths of an inch calibre, and was thought by Dr. Bird to have proceeded from a neighbouring corral, where both whites and Indians were engaged in shooting cattle, by a ricochet from the head or horn of a beef. The patient who was seated in a buggy at the time of the accident, experienced no pain, and felt no blow on the reception of the injury, but remarked to a gentleman, who occupied the buggy with him, that one of their guns must have gone off prematurely, as he judged from a sensation similar to that produced by the report and concussion of a shot fired near the ear. Observing the flow of blood his comrade informed him that he had been struck. He complained of the sensation of seeing stars and of some confusion of ideas, but quickly regaining his presence of mind and realizing the situation he dismounted from the buggy and went to a wash-stand and washed the blood away. There Dr. Bird saw him and probed into the cerebral tissue in search of the ball, but failed to reach it. He was then carried to his room. Free hemorrhage followed the entrance of the ball into the cranium from division of one of the branches of the occipital or posterior temporal artery.

On my arrival I found him tranquil, with a perfectly unclouded intellect; pulse 50 to the minute; pupils normal; no hyper- or anæsthesia; no serious motor or sensory disturbance. He had felt a slight frontal headache, and experienced a peculiar twitching of the depressores labii inferioris et anguli oris on left side previous to my arrival. An ice bag was upon the vertex which it was advised to continue. Expectant treatment was counseled, with morphia, if needed to quiet nervous excitement, a guarded use of stimulants if necessary, and the use of cathartics and depressants to combat inflammation. The idea of trephining was discouraged, and only to be resorted to as a last hope. He improved rapidly, and I learned soon afterward that he was up walking about, and attending to some minor matters connected with his official duties.

Dec. 23. Dr. S. arrived from Poplar River this evening, having performed the whole journey in an open buggy since morning, alighting several times, and wading through deep snow drifts.

24th. Examined Dr. S. to-day. Aside from some debility consequent on the inactive life he had led for several weeks, he was to all appearances free from injurious effects of wound. Had borne trip well. Desired my opinion as to his proceeding down by mail wagon to Bismarck; was anxious to reach his family in Indianapolis. Not oblivious to the magnitude of the risk he would incur by such a journey, he nevertheless thought his future progress would be impaired as much by the constant mental anxiety he would experience at the agency as by the hardships he would

<sup>1</sup> Subsequently ascertained by exact measurement.

be subjected to on the journey. I was obliged to express doubts as to the propriety of the contemplated overland trip, and charged him to proceed with extreme caution, laying over at any stage where he might feel the need of rest.

26th. Dr. S. returned in a sled from Matthew's Ranch, twenty-five miles distant, having suffered two convulsions at that stage of his journey. The first convulsion was ushered in by a loud subjective noise, like the ticking of a watch; by spasmodic movements of the fingers of the left hand which extended up the arm and soon became general (unilateral), involving the whole muscular system of left side. The first convulsion, a mild one, was followed immediately after partial recovery from it, by a much more severe one implicating the entire muscular system, in which the body was bent forward, the knees drawn up, and the arms folded across the breast. States that during the greater part of spasm he was in a comatose condition, the owner of the ranch being the only person present. It lasted about ten minutes; was followed by free emesis, lassitude, and a chilly sensation of left side. Observed that the wound discharged a few drops of pus during attack.

Is much confused in intellect; has an exhausted and haggard expression; pulse feeble, 45 to 50 beats to the minute. Was admitted into the post-hospital. Enjoined perfect quiet and rest; ordered a bowl of beef-tea and a broiled venison steak.

27th. Slept well; complains of muscular soreness; to be rubbed with warm camphorated spirits.

28th. Improving; much more rational; pulse 60; tent introduced into wound. Patient sat up a while to-day; complained in afternoon of some tingling in fingers and toes, left side.

29th. Enlarged wound by incision; local anæsthesia.

30th. Pulse 60; experiences some subjective noises; feels weak; has been sitting up too much; ordered an ounce of whiskey with hot water; nutritious food.

Jan. 3, 1879. Was sent for in great haste this evening; found patient greatly agitated on account of certain tingling sensations in fingers and toes; and cold on left side. Potassium bromide, gr. xxx at once relieved the symptoms; two triplex pills at bed-time to relieve alimentary canal.

9th. Awoke at 2 o'clock this morning with ticking noise loudest in left ear; troubled with a feeling of nausea and a mawkish, disagreeable taste in the pharynx and fauces, accompanied by an aching sensation of throat. These feelings lasted about three-quarters of an hour. Had been sitting up almost all of the previous day writing letters.

11th. Experienced unpleasant symptoms last night: ticking in left ear; some anæsthesia of left hand and foot; slept poorly; wound almost closed, pin head opening only for pus. Enlarged scalp wound by a V-shaped incision and introduced silk for drainage; opening in parietal bone found to be reniform in shape about one-half inch in length and one-quarter in breadth, the convexity looking forward and downward, and long axis pointing towards coronal and lambdoidal sutures; projecting piece denuded. Employed local anæsthesia. Some depression after operation. Evening, 30 grs. potass. bromid. followed by an aperient.

12th. Slept well. Feels well. Showed me a notice of his death in the *New York Times* for December 30, 1878, and commented, laughingly, upon the novelty of reading one's own obituary.

February 12th. Patient has experienced no ill effects from the cerebral

lesion since last date; drainage of wound has been secured by catgut and silk. All his corporeal functions have been discharged in a normal manner; has gained about eight pounds in weight since admission to hospital. Has walked out on several occasions, visiting the trader's store, post, library, etc. States that he feels as well as ever.

*March 17th.* Complains of severe supra-orbital pain on left side, and some nausea. Tongue coated, and digestive functions somewhat disordered. Ordered potass. brom. to relieve pain, and the necessary corrigent for gastro-intestinal derangement.

*18th.* Pain has shifted to right supra-orbital region and back of wound; superficial and neuralgic in character; cathartic acted well; to have two powders, 30 grs. each, of potass. brom.; pain much alleviated by them. Feels some coldness of right upper and lower extremities.

*31st.* No symptoms of sufficient importance to require noting have appeared since last entry. Drainage has been kept up by introducing twice daily several strands of carbolated catgut. Cephalalgia, accompanied with furred tongue and constipated bowels, alarmed patient somewhat, three days ago. A cathartic conferred prompt relief.

Impending changes in the weather have been felt by frontal headache, slight stinging pains in wound, numbness in the ends of fingers, sometimes of one hand and sometimes of the other, and muscular soreness.

*April 3d.* The small denuded and projecting piece of bone became detached, and was discharged from wound.

*5th.* Drainage discontinued.

*14th.* Wound nearly closed.

*May 2d.* Patient left by steamboat for Bismarck, D. T., en route to his home at Indianapolis, Ind.

*5th.* Received a telegram from Dr. S. to-day. He arrived safely in Bismarck, feeling better than when he left here.

*26th.* Letter dated May 18 received from patient to-day. Reached home safely and in excellent physical condition.

*Comments.*—This case presents points of considerable interest as bearing upon the question of cerebral localization of function, as well as furnishing one of those rare cases of survival after the reception of an extensive cerebral lesion. A regional diagnosis of the injury can be pretty definitely made from the knowledge we have of the direction taken by the ball, and from the recent advances made in cranio-cerebral topography. As stated, the tract of the lesion was probed by Dr. Bird on two occasions to the depth of about five inches, and its direction found to be diagonally forwards and across the brain towards the left anterior cranial fossa, slightly ascending. In accordance with the well known surgical principle, that where a ball has sufficient velocity to carry it cleanly through the cranium, if not escaping by a second opening, its momentum will be usually sufficient to transport it to the opposite side, it can be reasonably assumed in this case that the missile crossed the great longitudinal fissure, and found a lodgment in the first or second frontal convolution of the left hemisphere, having in its course passed between the cortical centres for movements of the face. By reference to the superficial landmarks necessary to determine the precise structure lying beneath, I find that the



wound of immergence is situated immediately over the centre of the fissure of Rolando, and about 8 mm. above the upper limit of the central ganglia. From the obliquity of its course I judge the ball to have entered the ascending frontal gyrus just in advance of the scalp wound, and to have passed through the anterior portion of cortical motor centre on right side; which presides over movements of the left upper extremity, and not far from the centre for movements of elevators and depressors of the angle of the mouth. Undoubtedly the structures seated above, in which we find located the centre for movements of the opposite lower extremity, were somewhat implicated by virtue of contiguity. A review of the semeiology furnishes evidence corroborative of the virtual accuracy of the above. By reference to the foregoing clinical history we find that in response to my inquiry at the time I visited the Indian Agency, the patient stated that he had experienced very marked spastic movements of the depressors of the lower lip and angle of the mouth on the left side; and subsequently he informed me that the probe when first introduced, and when withdrawn, caused a notable increase of these movements, evidently from irritating the centre just named. We should remember that a destructive lesion may be an irritative one, and produce spasm instead of paresis.

The above was the only motor symptom caused by the injury until December 25. On that date, after a fatiguing ride of 90 miles, accomplished in two days, he suffered a convulsive seizure which after lasting a short time abated, to be followed by an exacerbation. During the early part of this seizure the patient was conscious, and asserts that the disturbance of the motor functions was confined wholly to the left side of the body, but as the disorder increased he became unconscious, and was wholly dependent upon the owner of the ranch for information as to the parts of his system affected. He was told that the whole body was involved. This diagnosis could be fairly questioned, as proceeding from a witness unacquainted with the phenomena of eclampsia, frightened and confused in its presence, and hence incompetent to pronounce with any accuracy upon its clinical features, were it necessary to assume that the spasm expended itself chiefly or wholly upon the left side. But we have good reason for believing that the motor disturbance extended to the right side. Authorities in cerebral pathology (Brown-Séquard, Bastian) assert that indirect symptoms proceeding from parts remote may be produced by the primary lesion by reason of textural or functional relationship (reflex) by pressure, by inhibition, or stimulation, and Callender states that convulsions particularly attend lesions of that part of the right hemisphere which is above the corpora striata, exactly the one present in the case under consideration. Or pressure from retained pus in the lesion on left side involving the anterior part of first or second frontal convolution (non-excitabile) might have been exerted upon excitable structures behind (internal capsule, centre for face, etc.). In fact the wound for the first time in

several days discharged a few drops of pus during the convulsion, and the lowering of intra-cranial pressure consequent thereon was followed by a cessation of spasm. The element of exhaustion must not be lost sight of in this connection. Patient was greatly fatigued on reaching the ranch, and the subjective ticking symptomatic of this state was the first warning of the attack. The fatigue I regard not in the light of an efficient cause of the convulsion, but as contributing towards its occurrence by placing the patient in a condition favourable to its development; in other words acting as an exciting cause, the encephalic breach constituting the predisposing cause. Meningeal irritation is capable of inducing spasm, but there is no evidence that it operated among the causes producing it in this instance.

It is not unlikely that drainage of the wound practised subsequent to patient's reception in hospital, acted to obviate tension of the hemispheric textures and the consequent occurrence of spasm. We find, however, that after admission he experienced at various times sensory symptoms referable to the left side and extremities, such as tingling and anæsthesia of fingers and toes, and a feeling of chilliness, a disagreeable taste in the pharynx and fauces accompanied by an aching sensation of the throat, etc. These were slight and transitory, and are explicable, although the æsthetic area of internal capsule had sustained no lesion, on the grounds already given, *i. e.* by reflex action, pressure, etc. Or they might be viewed as the initial signs of, but not progressing to, the graver symptoms that go to make up the *tout ensemble* of paralysis or convulsion.

No psychic symptoms further than noted in history under date of Dec. 26, have shown themselves, even of the mildest grade. Patient's mind and disposition have suffered no change. The temperature taken for some weeks after admission ranged between 98.5° and 100° F.

Six months have now elapsed since the unfortunate accident happened, and no symptoms have shown themselves to indicate that there has been any advance of the injury into other parts of the brain. On the contrary the patient's progress seems to warrant the conclusion that progressive repair has been taking place, and to justify the hope that his tenure of life may not be materially curtailed. I am aware that wounds of the motor fasciculi of the internal capsule are said to be infallibly followed by descending secondary degeneration (Wasting Palsy, Curveilhier's), and that such a wound has been sustained in this case there can be no question. Not the slightest symptom apparent to me, however, yet points to its commencement, although the fibrillary contractions and localized muscular atrophy characterizing it are slow in showing themselves, and sufficient time may not have elapsed for their development.

It is almost needless to state that in injuries of this nature, with retention of ball, a prognosis must be given in an exceedingly guarded manner. The foreign body never becomes a harmless tenant, its presence always

furnishing a potential source of mischief, and recovery can only be held to take place in a limited sense, for notwithstanding the absence of symptoms, speedy dissolution may ensue with little or no preliminary warning.

Prof. Podrazki, in some interesting general observations with which he prefaces the narrative of a case of gunshot wound of the brain,<sup>1</sup> has recorded several of the various fatal complications that may be set up by the presence of a bullet in the encephalon. Years may elapse and still death take place from an apoplectic attack or by progressive asthenia. Acute encephalitis or meningitis (arachnitis) may occur, and this happens in the majority of instances, death resulting from cerebral compression due to the formation of pus, or from pyæmia. Chronic encephalitis may induce a condition of cerebral hyperæmia, which our best authorities in psychopathology mention as an important factor in the production of dementia or mania. (*Vide Winslow on the Brain and Mind*). Central abscess may give rise to fatal coma or convulsions, or may cause sudden death when all appears to be going on well. This was exemplified in the case of a soldier from the Italian war who, when admitted to hospital, informed the surgeon that he had a ball in his head. His pulse was only 44, but his symptoms otherwise were favourable, and his case was apparently progressing towards recovery when at some time afterward, how long it is not stated, he suddenly fell down dead. A post-mortem examination revealed a bullet lying in an abscess in the anterior lobe of the brain. Longmore, Guthrie, and others, record analogous cases occurring among soldiers. Again, a bullet may gravitate toward some vital part in the brain, and reaching it, immediately cause death; or it may gain the base of the skull and there remain for years without causing injury; or it may be eliminated. The latter, however, is of extreme rarity. At a meeting of the Clinical Society of London on Tuesday, October 11, 1878,<sup>2</sup> the remarks following the reading of a paper by Mr. Lucas on *Bullet Wounds of the Skull* are of interest in this connection:—

“Mr. Hulke recalled a case under the care of Mr. Lawson where the bullet, or leaden plug, was found at the bottom of a large ragged hole in the forehead, in a mass of brain. This man never had a bad symptom. Mr. Heath mentioned a case where a man put a pistol close to his head. He was not killed but rendered completely blind. No bullet could be found but there was a slight prominence on the opposite side of the head from the point of entrance. The man's health was still good. Mr. Barker mentioned a case which he had seen where a Chassepôt bullet had struck the forehead and buried itself in the brain. After living for months the patient died convulsed and comatose. Mr. Hulke said Larrey had written of the case of a man who survived after a bullet passing clean through the brain, so that a probe could pass through. Mr. Howse had had a case somewhat similar, only the result was fatal. Here the bullet passed right through. He cut down and found the bullet. Mr. Hutchinson referred to an interesting specimen in the Leed's Museum, being the skull of a woman who was not known to have received any injury, but in whose sphenoidal fissure a

<sup>1</sup> Am. Journ. Med. Sciences, April, 1872, quoted from Wiener Med. Wochenschrift, Dec. 9-16, 1871.

<sup>2</sup> British Med. Journ., October 19, 1878.

bullet was found when she died of fever. The President (Mr. Callender) said much injury might be done to the brain, and yet nothing particular happen. Injury to the convolutions did not seem greatly to matter if the *debris* was carefully removed. Mr. Norton spoke of a person now alive on whom craniotomy had been performed, and was put on one side for dead. He was not more stupid than the bulk of agricultural labourers. Mr. Lucas said the anterior lobes of the brain might be injured without any marked result following."

Mr. Fairlie Clarke exhibited to the Pathological Society, of London, November 2, 1869,<sup>1</sup> a boy aged 12, who had sustained a severe injury of the anterior convolutions without impairment of intellect or power of speech, and other members referred to several cases of like injury in which there were no marked cerebral symptoms.

It is proper perhaps that I should add a fact not mentioned in the history of the case, namely that the instrument used in probing for the ball prior to my seeing the patient, was a grooved director, a circumstance which adds to the remarkableness of the subsequent favourable progress. The practice so common of probing the brain in search of bullets, cannot, I think in the light of modern surgical experience and teaching, be regarded in any other manner than as superadding increased danger to the life of the patient, for it can be readily perceived that the probe in exploring the tract of a lesion through the soft mass of the brain, might unwittingly be passed into the uninjured portions, and reaching an important centre cause speedy death. The use of the trephine for the removal of balls unless they are known to be quite superficial, according to our best modern authorities is unwarrantable practice, the expectant mode of treatment yielding the best results. The probing of the brain becomes therefore a useless as well as a pernicious procedure. Incision of the integuments and removal of superficial debris is good surgery, and when we add to that the elevation of depressed bone for the relief of urgent symptoms we sum up about the only modes of operative surgical action that promise to yield curative results in penetrating wounds of the cranium.

FORT BUFORD, DAKOTA TERRITORY.

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#### ARTICLE XVI.

REPORT OF A CASE OF MALIGNANT TUMOUR OF THE ABDOMEN, GREATLY RESEMBLING, AND EVEN MISTAKEN FOR, ONE OF EXTRA-UTERINE PREGNANCY. By WALTER F. ATLEE, M.D., of Philadelphia.

I WAS asked (on April 21) to see Mrs. M—, residing in this city, in consultation with Dr. B—, a well-instructed conscientious man of quite considerable experience, to whom I had recommended her as a good obstetrician. She had been to my office in October last, to ask me to attend

<sup>1</sup> Lancet, November 13, 1878.

her in her confinement, which I then thought from her statement and her appearance, would take place in the early part of January. Dr. B— said that the patient's case was a perplexing one to him; he thought the woman to be with child, the parts of which he could distinguish by the touch through the vaginal and abdominal walls, and that the child was outside of the womb, and had been dead for several months. She had been visited by several physicians, who had been unable to reach any positive diagnosis in the case.

Mrs. M— was twenty-eight years of age; had been married three years, and had a child two years old, that she suckled until last November, when she weaned it, believing herself again pregnant. After the birth of this child she had never had any menstrual flow. Last June she noticed on the right side of the belly, low down, a hard lump, which had constantly enlarged; her general health continued quite good, with the exception of occasional attacks of nausea, until about Christmas, when she began to emaciate, and to feel her strength diminishing. When I saw her she was very thin and weak. There were no symptoms of poisoning from purulent or putrid infection. The belly looked and felt like one in which there was a child, surrounded by very little amniotic liquid; the projections to be felt in the mass while the hand was pressed over the surface, were very similar to what are felt in such a state of things. In the vagina a hard mass was felt, in size and shape like the foetal head, and in front of it was the mouth of the womb pressed against the pubes. The uterine probe entered two and three-fourth inches. In the peritoneal cavity there was an amount of fluid, quite sufficient to enable one to feel its fluctuation when percussion was made in front of the belly.

Near the angle of the lower jawbone, on the left side, was a lump the size of a pigeon's egg, hard and immovably attached to the bone, that had been there, the patient said, for two years; on the top of the head was another the size of a chestnut that appeared two and a half years ago; in the neck, above the clavicle, was one that had been there for five months; on the back of the head was another, as large as a chicken's egg, that made its appearance only three months before; and there was a fifth near the right hip. These lumps were absolutely free from pain; hard, firmly attached to bone, and having the skin loose over them. The peculiar enlargement of the belly, and the absence of the menstrual discharge<sup>1</sup>—in all cases the most important of the signs of pregnancy—were the chief reasons in this case for supposing the patient to be carrying an extra-uterine foetus. Of all the symptoms, rational and sensible, presented by pregnant women, only these two existed, or had existed. Those peculiar to extra-uterine pregnancy in its various forms, the passage of the decidua with hemorrhage, the violent colicky pains, etc., were all missing.

Under these circumstances there could be no reasonable doubt that the case was one of cancer of the abdominal cavity, and of ovarian origin, as such cases almost always are. To be doubly sure, to make certain that the case was not one of extra-uterine foetus, but was one of malignant tumour, an exploring trocar was introduced through the linea alba, and all the liquid that could be extracted, measuring just one pint, was collected.

<sup>1</sup> The aphorism of Hippocrates, section v., 61: "When a woman has not her menses, and has sickness of stomach, without chills or fever, believe her to be with child," very generally holds good.

It is a fact of great importance that ovarian tumours of a malignant kind are generally surrounded with ascitic fluid, and if the ascitic fluid is tinged with blood, this circumstance is a very suspicious one.

It is not true that all ovarian tumours surrounded with ascitic fluid are malignant, but it is true that malignant ovarian tumours are generally surrounded with ascitic fluid. It is said by some observers that an examination of the fluids from an ovarian tumour by tapping, will often inform us if the tumour is malignant; but most of the malignant tumours of the ovary are semi-solid. It is to the ascitic fluid we must look in doubtful cases.

Dr. James Foulis, of Edinburgh, was the first to direct attention to the subject of peritoneal infection from malignant ovarian cysts, and the first to describe characteristic cell-groups found in the cystic and ascitic fluid. These cell groups when found in ascitic fluid are not diagnostic of any one form of tumour, but of the *malignant condition* of the tumour in question, and of the peritoneal membrane. Dr. Foulis demonstrated that at no stage of its existence has the ovary any tubular structure, and that the eggs and the follicular epithelial cells have a different origin. The cells of the membrana granulosa are derived from the connective tissue corpuscles of the stroma, and the knowledge of this fact enabled him to detect the connection between the cell-groups in the cystic and the ascitic fluids and the diseased ovary and peritoneum. The stroma of the ovary is derived from, and is directly continuous with the structure that he calls the stroma of the peritoneum, which is remarkably rich in lymphatics, that pass into the ovary at its hilus, and ramify throughout its entire extent. He showed that a diseased ovary may affect the peritoneum in two ways; by shedding from its broken surfaces cellular elements, which settle down on the peritoneal membrane, and in many cases take root and grow; and by the passage of seeds from the malignant tumour along the lymphatics to all parts of the serous membrane.<sup>1</sup>

The colour of the liquid collected in the case narrated above was yellowish-green, the specific gravity 1017; it was very albuminous, coagulating quickly, both by nitric acid and by heat. The test-tube could be turned upside down without losing its contents. On being allowed to stand, there was a light flocculent deposit in the form of a cone, below this a denser flocculent precipitate, arranged horizontally, and a still denser precipitate, of a reddish colour, below that. Microscopical examination of these precipi-

<sup>1</sup> The very valuable papers of Dr. Foulis above referred to, are published in the *British Medical Journal* for June 26, 1875; in the *Edinburgh Medical Journal* for August, 1875; and in the *British Medical Journal* for November 2, 1878. It is certainly surprising that Mr. Spencer Wells should omit all mention of the name of Dr. Foulis, in his *Lectures on the Diagnosis and Treatment of Abdominal Tumours*, delivered last year before the Royal College of Surgeons of England, and give the credit to Mr. Thornton of the discovery of these cell-groups.

tates showed large numbers of red blood-corpuscles, epithelial scales, large cells, six or seven times as large as a red blood-corpuscle, with large nuclei, and nucleoli. There were large masses of these cells, proliferating in a most extraordinary manner, as described by Dr. Foulis; from a minute solid nucleus, invested with protoplasm, up to large free nucleated cells, with bright, sharply-defined oval nuclei, with nucleoli, all stages of cell development, could be seen in each mass. The discovery of these masses of cells left no longer any room for doubt, had there been any before, of the true nature, in this obscure case, of the tumours in the abdomen.

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#### ARTICLE XVII.

AN OLD NEURALGIA CURED BY AN OPERATION. By JNO. T. KING, M.D.,  
of Baltimore, Md.

MR. W. J. H., æt. 48, merchant, slender and pale, has enjoyed good health, with exception of repeated attacks of neuralgia. Devoted to an extensive business, with little time for recreation; of perfectly temperate habits. When quite young he fell, striking the frontal bone, and depressing to a considerable degree the outer tablet. Included in the cicatrix which remained was the supra-orbital nerve at a point about an inch above the supra-orbital foramen. The tissues were firmly bound to the depressed bone. From his own statement, as well as that of his parents, we are unable to say positively that neuralgia followed the injury immediately, though we know nothing to the contrary, as both were established so early in life; though I think the sequel will demonstrate that the neuralgic affection followed the injury as cause and effect.

Since early boyhood, however, he has been a martyr to neuralgia; scarcely a day passed in which he did not feel more or less pain over the right hemicranial region. At times he is almost distracted, suffering intense agony for days; the least exposure insuring an attack.

He came under my professional notice about a year ago; the usual remedies were resorted to. Quinia, in large doses, and other alkaloids of cinchonia, salicylic acid, iron; strychnia, arsenic, belladonna, chloroform, etc., were faithfully tried, and in various combinations, without affording more than temporary relief. I thought an operation justifiable, though I hesitated to promise permanent relief. He appeared anxious that surgical means should be resorted to. In consultation with Dr. Winslow it was determined to operate at once. Dr. Winslow inserted a narrow bistoury at a point about  $\frac{3}{4}$  inch below the cicatrix, and carried it subcutaneously to about the same distance above, dissecting up the integuments from the pericranium. A tent was introduced through the wound, and retained *in situ* for ten days. Complete relief followed the operation. Though nine months have since elapsed, there has been no return of the neuralgia. Mr. H., feeling such confidence in his cure, has intentionally exposed himself, thus tempting an attack, but none followed. His general condition has likewise improved, as would be expected.

## REVIEWS.

ART. XVIII.—*The Principles and Practice of Gynæcology.* By THOMAS ADDIS EMMET, M.D., Surgeon to the Woman's Hospital of the State of New York, etc. With one hundred illustrations, 8vo., pp. 855. Philadelphia: Henry C. Lea, 1879.

It is safe to assert that no medical work has issued from the press for many years, the appearance of which has been awaited with so much interest as this. The explanation is not difficult. The long connection of the author with the leading woman's hospital of the country, his well-known devotion to his chosen branch of practice, the great practical value of the numerous contributions he has from time to time made to the floating literature of the subject, and the sterling merit of his work on vesico-vaginal fistula, all conspired to excite anticipation as to a complete and standard treatise from his pen. We chronicle the appearance of the work with pleasure, and tender to the author our congratulations on the completion of his task. In attempting to discharge the duty which has devolved upon us we are impressed with a sense of responsibility proportionate to the great and general interest which is felt in regard to the work, and wish it had been committed to other and abler hands. Nevertheless, we make the attempt to present to our readers the results of a careful examination of the book, or at least to give such an account of it as will enable them to judge as to how far the author has realized the aim announced in the opening lines of "representing the actual state of gynæcological science and art."

We will begin by stating what we believe to be some of the general leading characteristics of the work.

First of all, it is pre-eminently an original book. This does not apply merely to novel operations described, or new methods of treatment directed. Even the preface bears the marks of individuality and independence of judgment, both as to manner and matter, and the reader will not advance far into the body of the work before he discovers that it is written by one who has a mind of his own, and who is not in the habit of going beyond himself for the sources of his knowledge. It is a work based upon a vast amount of clinical experience derived from twenty-five years of constant service in the New York Woman's Hospital, from sixteen years management of a private hospital, and a large consulting practice. It is, therefore, a practical, as well as an original book, and the originality of its measures of treatment is derived from experience, and not from theory, a fact to be kept duly in mind whenever doctrines are advanced to which we cannot assent, or remedies prescribed which may not agree with other authorities.

Closely connected with this feature of the book, and naturally consequent upon it, is the tone of authority in which it is written. The author assumes the position and the tone of a master, and since his large experience justly gives him the right to do this, we will not complain, although at times it leads him to dogmatize, and occasionally we find him austere.



The book is written in no narrow spirit of specialism, but upon the broad ground of science. Thus, in the preface, giving his reasons for the very wide course of excluding formal prescriptions, he says:—

“No man can prove successful as a gynæcologist who has not mastered the principles of medicine, and stored up experience in the general treatment of disease.” Again, he says: “For the successful treatment of these diseases, a more general and accurate knowledge is requisite than in the practice of any other branch of the profession;” and “the advocate for either general or local treatment exclusively, or he who neglects to give the proper attention to both, does not possess sufficient practical knowledge to extend his usefulness beyond the range of an empiric.”

A prominent feature of the book is the tabulated statement of facts relating to the subject of the various chapters. There are no less than sixty-two tables of the particular features and co-related symptoms of different diseases or conditions. To give a more accurate idea of this very notable feature of the work we may state that in regard to fibrous tumours twelve tables are given, and these set forth and show the ages at which the subjects of these tumours were first examined, their average age, the age at puberty of those thus affected, the number of unmarried, sterile and fruitful, the regularity of menstruation as affected by fibrous growths, the pain suffered at different periods of the flow, the connection between regularity of menstruation and degree of pain, the duration and quantity of the loss of blood, and many other particulars. In the chapter on Menstruation there are also twelve tables, presenting the facts, in various relations, derived from two thousand three hundred and thirty women treated in private practice, and in the chapters on Cellulitis, Versions, and Flexures, the same method is pursued. The accuracy of these tables is vouched for by being the personal work of the author. Their value is not to be estimated by the bearing they have upon practice, meaning by practice the administration of drugs. As positive and reliable contributions to our knowledge, and as furnishing data for future use in the study of these subjects, too high an estimate cannot be put upon them, and Dr. Emmet's claims will be cheerfully admitted that “their parallel is not to be found in the whole range of gynæcological literature.”

Minuteness and precision of direction as to methods of treatment, and inculcation of the most scrupulous care after operative procedures, are a peculiar feature of the book. It will doubtless surprise many to read the precautions that are to be observed by the patient during the application of a sponge-tent, she not being permitted, *under any circumstances*, to get out of bed. Nevertheless, prudence has been taught, the author states, by unhappy experience, and time only confirms him in the necessity for caution. Even the state of the weather at the time of resorting to dilatation with tents is to be considered.

“The nervous system of a patient will be less taxed, and the power of endurance greater on a clear day. Moreover, experience has taught me that in a state of the atmosphere favourable to an active condition of the skin, there will always be less danger from blood-poisoning. I have also been impressed with the conviction that the occurrence of cellulitis is a far more frequent sequel to the use of the sponge-tent, when employed during the prevalence of damp, cold, and easterly weather.”

After operations the treatment of the patient is directed on the same plan of extreme caution, of which the care of a case of incision of the cervix, as given on p. 360, may serve as an example. The author well says

that "many a brilliant operation has failed, and even entailed disastrous results upon the patient, for the want of this care in the after-treatment."

So we also find, not only minute directions for such an important matter as properly plugging the vagina, but for the administration of a foot-bath and the making of a mustard plaster. For the patient such minutiae are not overlooked as the arrangement of the pictures and furniture of the room and the wearing of a neck ribbon; and for the physician, the care of the finger-nails is shown to be one of the great little things; in the introductory part we are told that they should be kept short and clean, and in the chapter on Ovariectomy the very strong language is used that "the death-warrant of many a patient is carried under the nails of the operator."

Whatever may be the measure directed or operation described, the particular manner of its execution is emphasized and insisted on; that way, and that way only, ensures success. No one can complain of this. If a man's methods of treatment are to be tested, it is only just and fair to demand that his directions be scrupulously followed. Still, we think we can point to places in this book where the impression will be conveyed, although without such an intention on the part of the author, that it is very difficult to follow all the minutiae of direction, and success consequently will be hard to attain.

Finally, the strongest instance of the estimate placed by the author upon the most scrupulous attention to every point, finds expression at the close of the chapter upon the principles of general treatment in the following language:—

"The successful physician or surgeon is eminently noted for his personal attention to details. . . . The purpose of this chapter has been, and the object in view throughout the work will be, to impress the reader with the fact that *success in the treatment of the diseases of women lies wholly in attention to minute details.*"

Entering now upon an examination of the work, we find that the first chapter is on the relations of our climate, modes of education, and social conditions upon the health of our women. It is a most excellent chapter, one which we wish had been extended to thrice its length, and that then it could be printed as a health tract, and scattered broadcast through the land. There is no sort of doubt that our climate, with its great lack of moisture (away from the sea-board), with the severe cold of its winters and the intense heat of its summers, with its rapid and great variations of temperature at all seasons, is a most trying one, especially to the delicate nervous organization of females. In addition, we have over a vast expanse of the interior of our country the ever-acting and insidious but powerful influence of malaria, depressing nervous force both voluntary and organic, interfering with nutrition, and the direct cause of many forms of local disease. "Malarial congestive hypertrophy" we find recognized in the work, and it is frequently the pathological cause of menorrhagia, as is well known by those practising in malarial districts. We fully agree with the author in his estimate of our climate, and cannot think that criticism just which would arraign him for holding the opinion that it is one deleterious to the health of women.

The customs of our people in bringing up children justly come in for animadversion. Truly, American children are fearfully and wonderfully brought up, and are looked upon with amazement by all foreign visitors from civilized countries. The evil effects of indulgence and want of restraint begin, of course, with the earliest years, but it is only to the period of

girlhood and the passage into womanhood that our author applies his remarks. "With the first step to womanhood the young girl begins to live an artificial life, as a tribute to a degree of civilization and progress which is only consistent in a general disregard of all the laws of health," and the attractions of society are allowed to dazzle her, and its dissipations to sap the foundations of her strength before the mind is mature enough to carry her safely through the one, or her body sufficiently developed to bear with impunity the other.

Our system of education comes in for its share of just rebuke. Throughout all the Eastern, Northern, and Western States public instruction has been developed into a vast and complicated system, giving employment to a large army of teachers, who, impelled by professional pride, and with the most laudable aims, have pushed their demands upon the scholars under their care beyond the limits permitted by hygienic law. To such an extent has this been carried, that it has aroused the attention of the profession, and in many quarters they have made vigorous efforts, and still more must be made, to correct the abuses which have crept into the system. The works of the late lamented Dr. Edward H. Clarke, of Boston, will occur to every one in this connection. The author alludes to them with praise, and confirms in the strongest manner the evil effects of excessive study during the period of active sexual development of girls.

"On looking over my case books, I have been surprised to find the same statements repeated again and again, viz., that the sufferer had taken the highest honours at some noted female school or college, and gave no tangible signs of weakness until reaction took place after her return home."

Within a year past the writer of this was called upon to deliver a lecture before an association of teachers upon some points of school hygiene, and took occasion to enforce the physiological law that two organs of the body could not be simultaneously pushed in development without injury to one or the other, and stated that the medical profession would never be satisfied until, in every girl's course of education, there was a break of a year, the particular time to be chosen by the mother. The position was assailed by some of those interested as entirely impracticable, as interfering too seriously with education to be entertained for a moment. What they will say now to the author of this work we cannot imagine, since he claims that

"to reach the highest point of physical development, the young girl in the better classes of society should pass *the year before puberty and some two years afterwards* free from all exciting influences. . . . Her mind should be occupied by a very moderate amount of study, with frequent intervals, of a few moments [months?] each, passed, when possible, in the open air. *There should be no studying at night under any circumstances.*"

It is the medical profession that must correct these abuses in our forcing system of education, which we are convinced, which we know from actual observation, is doing much to sap the strength and undermine the health of our growing girls, and the profession may thank Dr. Emmet for his powerful influence in aiding them to awaken public attention and influence public opinion.

The three following chapters are upon instruments and modes of using them, with directions for examining and recording cases, and are profusely and well illustrated. The author here sets forth his well-known predilection for the scissors as a cutting instrument in all operations about the genital organs. His remarks upon digital examination are excellent;

"to detect slight changes, it is equally important to realize the fact that the lighter the touch the more thorough will be the appreciation of the sense."

Rectal examination is inculcated as indispensable, not only as enabling the examiner to reach a portion of the pelvis inaccessible from the vagina, but as affording information as to the state of the bowel itself, in diseased conditions of which all the pelvic symptoms may have their origin. Simon's mode of examination, by introduction of the whole hand, is not indorsed, as it is believed as much information can be gained by fingers, while the proceeding is not without risk. For the same reason, a risk out of proportion to the value or amount of information gained, he rejects digital examination by the urethra. In regard to the use of the uterine sound, there has heretofore been but one caution impressed upon the student, to avoid resorting to it when there is a possibility of pregnancy. Another is added here, the existence of cellulitis, a pathological condition to which the author attaches the highest importance, and one which the use of the sound might awaken from a latent condition into dangerous activity. The utmost care is inculcated upon this point; to overlook the existence even of a slight cellulitis is culpable.

"Many a poor woman has had to suffer from the carelessness of her physician in overlooking a latent cellulitis, and endured years of bad health, and often permanent sterility, from this disease being rekindled by the unskilful use of the probe or sound, and extending beyond the limits of the first attack."

The following chapter is, in title, etiological, in substance largely pathological, and affords us a view of the principles which form the basis of the author's treatment, and presents some points of difference from current theoretical doctrines. The origin of all diseases of the generative organs of women he finds in the sympathetic nervous system, the great regulator of the circulation and of nutrition. This nervous system in perfect action, we have health; this deranged, and we have disease. The derangement affects nutrition, and impaired nutrition is the chief and most active pathological factor for our consideration, since with this impaired healthy nerve force cannot be generated. Faulty nutrition is either congenital or acquired, and consideration of the latter affords another opportunity of showing the evil effects of "building up a brain out of season" by forcing intellectual development at a time when nature says that sexual development shall go on. Faulty nutrition produces derangement of the circulation, and this derangement is congestion, and this congestion is venous congestion, not arterial.

"Arterial congestion, the result of some local irritation, is a condition always temporary in duration when the reparative powers are in a state of integrity."

"It is necessary at the outset to appreciate the marked difference between passive congestion, which is generally [always?] venous and inflammation. These terms are usually regarded as synonymous, but erroneously so, as are many in connection with uterine disease."

We know that the *conditions* have been confounded, but do not know by whom the terms "passive congestion" and "inflammation" are considered synonymous.

The next step to this is a denial of uterine inflammation entirely, except in the puerperal condition. This is done explicitly and positively (p. 81), and is repeated on p. 259 and elsewhere.

"Inflammation cannot exist without molecular death, and its products are easily recognized until absorbed. We may look in vain, after death, for any evidence of an existing endometritis, so called, or for an ulceration of the cervix, as it is termed, for neither of these conditions is inflammatory."

The denial extends not only to the infarcted condition of the organ, known formerly as chronic metritis, and for which many different terms, among them hyperplasia, have been proposed; but also to the internal surfaces of the organ, and we are to be done with "internal metritis" whether corporeal or cervical. It is scarcely fair for the author to add that "the facility for locating its limit exclusively to the cervix, body, or fundus, rests only in the brain of the theorist," since we know of no one who dots out these distinctions with any other view than that of aiding the student to master the subject, or to show him that the affection of one part may predominate over the other; or who does not teach, with the author, that "it will be but a question of time before the whole canal becomes equally involved."

It is in the connective or cellular tissue of the pelvis that the author finds the source and origin of the greatest number of ailments of the female generative system. Pelvic cellulitis, pelvic peritonitis, and hæmatocele, this is the order of frequency in which diseases are placed, and in the first is found the cause of symptoms which are too frequently attributed to the uterus or ovaries (pp. 90, 259). More of this will be found in other portions of the book and recurred to.

The extension of morbid influence from the ganglionic system, the great regulator of nutrition and of the reproductive organs, to the cerebro-spinal system, or, in other words, the origin of what are termed "nervous" symptoms and manifestations, is most excellently sketched, and should be read and reflected on by every student and practitioner. Hysteria and its congeners only make their appearance when the nervous energies are unexpended by active occupation, or have long run in the vicious channels of self-indulgence or forced excitement. She who is compelled by circumstances to healthy occupation escapes, the idle and the luxurious suffer. Those who have been trained to exercise moral restraint resist the morbid influence which is manifested in an exaggerated degree in "those in whom that sheet anchor of womanhood is lacking, a devotion to duty and a healthy sense of moral obligation." We wish that every parent and every instructor of youth could have these facts impressed upon them.

The chapters upon the general principles of treatment will be found as interesting reading as any in the book. To improve nutrition, to correct anæmia, to restore tone to the vessels of the pelvic organs and cellular tissue—these are the objects to be kept in view. First of all the patient is to be freed from the pernicious influence of anodynes, alcohol, and coffee. These are "insidious poisons to the nervous system," and the author places no insignificant estimate upon their influence in rendering recovery impossible; they must be banished; no compromise is to be entertained. We cannot deny the statement that there are many instances in which the habitual use of stimulants have become a confirmed habit from the culpable error of physicians in ordering them. Still, we hear the charge made much more frequently than truth will warrant, for it is the easiest and readiest excuse for the victim to plead in the effort to transfer the blame to other shoulders than his or her own. Moreover, the young practitioner should remember this: if alcohol in any form is ever prescribed upon any occasion, that one prescription will be extended by the patient,

if at all so inclined, to cover the whole of life. A resort to anodynes for the ordinary ailments of woman is most strongly discountenanced and denounced. There are three occasions for their use: in inflammations, after operations, and in malignant diseases. These are the only circumstances in which they are demanded, and to administer them frequently is to make a general wreck of the nervous system.

"In private practice the case becomes almost a hopeless one from the hour that the patient becomes dependent upon the use of an anodyne."

The hypodermic method, from its seductive facility, comes in for the strongest condemnation:—

"The inventor of this method has given, I fear, a curse to the human race instead of a blessing. I may be deemed prejudiced, but I have long felt that the medical profession is largely responsible in the abuse of this instrument for the wide-spread existence of the opium habit. This vice is increasing so rapidly all over the country that we shall, to our sorrow, at no distant day, rival the Chinese in the consumption of this drug."

In the absence of statistics we cannot deny the statement; still, we believe the picture over-drawn, and the charge against the profession too sweeping. The caution against a too ready resort to direct anodynes is, however, needed and well put, and should be carefully remembered by the young practitioner.

The first step in direct treatment is the gain of the patient's confidence by the physician. This, and the exercise of moral control, and the influence of the stronger mind of the man over the more dependent and confiding mental organization of the woman are justly estimated as of the highest value, indeed, as indispensable in the successful treatment of this class of diseases. The examples given of this kind of treatment are marked, but doubtless true to the letter. It will immediately occur to the family practitioner that he cannot bring to bear upon his patient such heroic and apparently cruel measures, and the objection is just. In this respect the consulting physician enjoys a power, the direct result of his position, which the home physician cannot exert, a fact the author duly recognizes. Nevertheless, it should be borne in mind that the principle is the same everywhere, and the instruction worthy of being followed as far as it possibly can be under all circumstances. The same mental method of treatment is brought to bear in the chapter on hysteria, to which we shall not refer further than to regret that it was not extended to a length more proportionate to the importance of the subject and the frequency with which the disease comes under medical care. Here, while showing the efficacy of mental influence and the power for good of disagreeable remedies, we are surprised that the author has omitted to say anything as to the use of cold water, since it is inferior to none, and is directly in line of his favourite treatment. A heavy douche poured over the upturned face of the patient, administered without mercy, will not be long continued before the most violent fit of hysterical convulsion finds its end. Moreover, an order to "bring on the tub again" will promptly prevent a threatened paroxysm.

Food, bathing, sunlight; these are the next remedies. The manufacturers of pepsine and artificial digestives will find but little comfort from the statement that digestion can at first be aided very little by the use of medicines. The importance of due action of the skin is insisted on, with directions for improving baths, while sunlight is here formally elevated to the dignity of a remedy, and one of no mean importance. Without it

the preparations of iron will not correct anæmia; with it the capillary circulation is increased in vigor, elimination hastened, and assimilation promoted. A sun-bath is to be prescribed as part of the daily regimen of the patient.

But very little is said about medicines proper in this chapter. Iron occupies the chief rank. One class, however, the author believes to be neglected—"brisk purgatives from time to time, in the form of some mercurial." He duly considers the character of the patients, but still goes in for good old-fashioned doses of these medicines.

There is one point which receives especial consideration here, and upon which the author is very strong. It is the danger which all these patients run of lapsing into chronic invalidism and of becoming hopelessly bed-ridden. We think we read here between the lines a commentary upon a system of treatment which has very high authority in its favour, but which must be considered as yet passing through its trial stage before the profession. The fate of a patient who falls into this condition is a most lamentable one, and the physician who even passively acquiesces in it is reprehensible.

"There never was a greater fallacy in practice than to place in bed a woman suffering from uterine disease, with the expectation that she would recover her health by remaining there. . . . This is the history of becoming a confirmed invalid, due, in the beginning, entirely to the ignorance, to the indifference, or to the want of an honest purpose on the part of the attending physician."

A pathological recapitulation introduces the subject of local treatment, and this portion of the work presents more perhaps of novelty in doctrine and practice than any other, and will certainly be read with the deepest interest. Impaired nutrition, consequent loss of tone of the pelvic vessels, consequent increased weight of the organs, consequent increased secretion. Improvement of the general system effected by general measures, will improve this condition, but will not suffice for a cure. The tone of the vessels must be restored by directly exciting reflex action of the nerves which accompany them, thus causing their contraction. To effect this we have three agents—electricity, cold, and heat. The first is briefly dismissed as a "valuable adjuvant," and we hear but little, if any, more of it throughout the work. Cold is stated to be objectionable, because a congestion greater than that which existed before follows reaction from its application. It is in heat—in hot water—alone, that the author finds an efficient remedy. Upon this point he makes a revolution of doctrine, for the teaching of not many years ago was that injections were tonic and contractile in proportion to their coldness, and relaxant in proportion to their warmth. Thus taught Scanzoni, Bennett, West, and others. Not so the author. He holds that positive and permanent contraction is produced by hot water injections, given according to his plan, essential features of which are that the flow shall be of considerable duration, and the temperature of the water high—so high that it cannot be administered through a metal tube. To establish his views he enters into an extended and minute explanation, in regard to which we say that we are entirely willing to accept his statement of facts, while we demur to some of the explanations. The beneficial effects being proven by clinical experience, it matters little whether or not "any plan of treatment could be more rational or appeal more forcibly to the good judgment of every one." This measure of local treatment is claimed as entirely original by the author; he is "the first to use the agent in a systematic manner and to have done

so with a definite purpose, in keeping with what I considered to be sound pathology."

Its value is such as to justify a place at the head of the list of local remedies.

"The use of hot water vaginal injections is equally beneficial in all those conditions which constitute the various forms of disease in the female organs of generation, and which are amenable to any treatment other than a surgical procedure; and equally so, whether the congestion be arterial or venous. . . . So beneficial is its use, except in displacement of the uterus, that I believe more can be accomplished by this agent, and a carefully regulated plan of general treatment, than by all other means combined." P. 120.

"Since I have understood the action of hot water vaginal injections, I have realized that this remedy is destined to overturn both the theory and therapeutics of uterine disease, as now accepted." P. 258.

We know of no gynæcological authority which places so high a value as this upon a single remedy.

The next point in treatment is to see that the uterus occupies such a position that its circulation is unobstructed. The particular position of the uterus is to be judged separately for each individual; there is no common standard to which cases are to be made to correspond. Farther, "it is not so much the position which is to be corrected, as it is the obstruction to the circulation in the organ which is to be removed." In regard to fitting an instrument to effect this object, the practical point is insisted on that there is in every woman a normal health-line of position for the uterus, to which the organ is to be carried and maintained, but no farther; that keeping it above this line produces an equally deleterious influence in the way of obstructing the circulation, as allowing it to sag below it.

Thus far a good deal of ground has been gone over in regard to local treatment, and nothing has been said of medicines. Indeed, if the principles laid down are accepted, direct applications, of course, play but a very subordinate part. This is the direct consequence of the author's teachings, and the position is fully accepted by him.

"If the so-called ulceration of the cervix be accepted as a cause, and not an effect, the use of caustic applications is a consistent practice, and should be persevered in until the surface has been healed.

"But if it be held that the increased secretion is simply an attempt of nature to relieve an obstructed venous circulation, and that the erosion is a surface from which the epithelium has been washed away by the discharge constantly flowing over it, then such a course of treatment is to be deemed not only irrational, but most hurtful.

"A whole generation of physicians has been misled by the delusion of *chronic inflammation and ulceration* of the uterus, conditions which no one has yet been able to demonstrate on the dead body."

Nevertheless, medicines for local application are advised. Nitrate of silver occasionally, impure carbolic acid frequently, iodine oftener, and these, with tannin and glycerin, nearly complete the list. It is held to be an essential character of applications that they be "innocuous to healthy tissue, as we cannot limit their action to the diseased surface exclusively." The author admits that "when the surface of the uterine canal has become covered with granulations or vegetations, the actual cautery and the strongest mineral acids may often be applied with impunity," yet he thinks the practice unnecessary, and to be avoided.

One so conservative as the author would not, of course, occupy different ground from gynæcologists in general as to intra-uterine injections. In



the undilated organ they are dangerous with whatever instrument given, or with whatever precautions administered. He rejects, however, the generally received explanation of their evil effects, as being produced by passage of the fluid through the Fallopian tubes into the peritoneal cavity, but would rather explain them by some effect on the nerve centres, which we do not understand. Dilatation of the uterus, however, is of itself a curative influence, and prepares the way for hot water injections, which exercise a more decided action on the interior of the uterus than any other remedy. A large part of the eighth chapter is taken up with the directions for carrying out these measures of treatment.

In many quarters we believe the impression has prevailed that this work would be ultra-surgical in character, the impression having had its origin perhaps in the fact that most of the author's contributions to the journals have been upon operative subjects, perhaps in the well-known fact of his skill as an operator. Any impression of this kind will be removed by the perusal of this chapter, and whatever may be the judgment of the reader as to the author's predilection for operating in any certain line of cases, there cannot remain the slightest doubt as to his position upon operative interference in general, from the following strong and pointed remarks:—

“The female organs of generation have been mercifully endowed with a degree of tolerance to injury not possessed by the male. . . . But few, however, of the many physicians who undertake to heal these diseases fully realize that there is naturally a limit to this immunity. No portion of the body has suffered more in consequence of incapacity on the part of members of the profession, many of whom, from ignorance, have been unable to appreciate in detail the true bearing of all pertinent points. . . . Under the guise of surgery the uterus has been subjected to a degree of malpractice which would not have been tolerated in any other organ of the body. Its cavity has been, and is still made, the receptacle for agents so destructive, that no conscientious man would employ them for the treatment of disease in any other cavity of the body without a full appreciation of his responsibility. But I trust that we have already passed the heroic age, and that in the treatment of these diseases we may be governed hereafter by the same rational principles as would be applicable elsewhere; that we may simply, as we term it in this country, exercise our ‘common sense.’”

We have devoted a very considerable amount of space to a consideration of that portion of the work devoted to principles, because principles form the foundation upon which the superstructure is erected, because there is much in this part novel as well as interesting. A few portions must now be selected from the more practical part for examination and comment. We begin with the chapter devoted to cellulitis because of the high rank in importance given to this disease by the author, and because in it he repeats and amplifies some of his peculiar views. It is a disease, we are told, very frequently overlooked by practitioners when circumscribed, or not appreciated, if discovered. Yet it is at once the most common and the most important of diseases of women.

“A great advance will be made in the diseases of women whenever practitioners become so impressed with the significance of cellulitis as to apprehend its existence in every case. The successful operator in this branch of surgery will be he who is always on the lookout for the existence of cellulitis, or who is taking measures to guard against its occurrence.”

The existence of cellulitis is the first point to determine in making an examination; if any point of thickening or tenderness is found, the prudent practitioner will abstain from any further manipulations. The sound is not to be used; a displaced organ is not to be restored to place; no application is to be made to the uterine canal.

The full importance of the disease can only be understood, however, when it is looked upon as the "key to many of the pathological changes now treated as uterine disease."

"We must look to pathological changes in the connective tissue as the cause of the results we now regard as the original disease in the uterus and ovaries."

That this is revolutionary doctrine is fully recognized, for it is again said elsewhere that upon this point we have hitherto "confounded cause and effect." It is also further said that an affection of a *portion* of the cellular tissue may produce congestive hypertrophy of the uterus.

We find the reasoning presented which has led to this conclusion:—

"Experience teaches that hot water is indispensable in the treatment of all uterine disease, and, since it only affects the supposed disease indirectly after giving tone to the bloodvessels in the connective tissue of the pelvis, we may fairly raise the question as to the original seat of the disease."

There will be found those, we believe, who will not admit the premises, and more who, having accepted them, will not admit the conclusion.

The statistics of this chapter are made up of tabulated analyses of 303 observed cases, with all their possible complications. As to the different divisions of pelvic inflammation, as cellular and peritoneal, the author does not admit them, but rejects the terms para- and perimetritis, and says the distinction cannot be made at the bedside. As to the causes, he finds a large percentage of cases due to criminal abortion and other violation of natural laws, and attributes great influence to the use of the sewing machine, although the tables do not sustain him in the latter.

The treatment of so important and frequent a disease receives, of course, due consideration. The main idea is to produce contraction of the vessels, and thus relieve pelvic congestion, by hot water injections long continued. Other measures and remedies are duly considered, and the treatment of pelvic inflammation, in its different aspects, detailed at length. The chapter closes with a quotation of Dr. Brickell's views as to evacuation of the effused serum early in the disease, a proceeding which the author does not counsel, because he considers it dangerous.

One of the most important portions of the work is that devoted to the consideration of lacerations of the cervix. These lacerations, a very common consequence of labor, have been long enough known and understood. Their importance, in a gynæcological sense, was first recognized by Dr. Emmet in 1862, and since that time this lesion has been the subject of several communications to the profession. Two chapters are here devoted to it, and it occupies the same relative rank among the accidental, that cellulitis does among the natural causes of female diseases. Indeed it would be difficult to exaggerate the importance which is attached to it throughout the work. "At least one-half of the ailments among those who have borne children are to be attributed to lacerations of the cervix." It is stated to be the most common cause of irregularity of menstruation both in regard to time and quantity; in most cases it is the cause of hypertrophy or sub-involution of the uterus after delivery; for many years the author has met with few or no cases of sub-involution not due to it. Finally, he does not hesitate to express the opinion, and that more than once, that laceration of the cervix has a very close connection with the origin of phthisis, and that malignant disease frequently springs from the seat of this injury.

Although this subject was formally presented to the notice of the profes-

sion in 1874, yet, singularly enough, it has attracted but little attention, and been the subject of but few communications. Abroad, it is in Germany alone that the importance of the injury and its influence in causing disease has been recognized. Several papers have been published in that country by men eminent in the profession. In England, the last edition of the leading work on gynæcology, bearing the date of 1878, barely mentions it. Indeed the author had better have omitted any reference to it at all since if it is of one tithe the importance which Dr. Emmet attaches to it, it deserves more than the mere statement of its existence, and a scant half page devoted to it. From what has been published abroad, however, and from papers which have appeared in this country, it is only just to say that they sustain the author in the main, certainly so as to the consequences of the more pronounced forms of the laceration. Thus, to attribute the origin of malignant disease to a simple scar, or a lip of the laceration may seem exaggeration, and at variance with generally accepted pathological doctrines, yet in this view Breisky and Veit seem to concur,<sup>1</sup> the latter having found three cases out of nine of malignant disease originating in this way. Although this is far from establishing the causal connection of the two, yet it will not do to despise even a suspicion which practical men gather from experience.

In regard to the frequency with which laceration of the cervix plays an important part in causing disease or demands direct treatment, there is a wide difference between the author and other observers. Thus, his statistics of the last five hundred women coming under his care, give a percentage of 32.8 per cent.; while Mundé<sup>2</sup> gives about 6 per cent. Dr. Goodell,<sup>3</sup> about one out of every six, Hanks,<sup>4</sup> a little over one-eighth, and Dr. Barker,<sup>5</sup> says, speaking at a time at least four years after his attention had been especially called to the subject, that he had only succeeded in finding two cases.

Various reasons have been given for this discrepancy. Different classes of patients furnish different results. Different treatment during labour and circumstances compelling exertion or permitting due rest afterwards undoubtedly play a chief part. In regard to the first there is an important obstetrical lesson. We have long been convinced that the late improved (we write "improved" advisedly) teachings in regard to an early and frequent resort to the forceps have been carried too far, not by those who teach them but, as is always the case, by rash and injudicious men, carrying the teaching beyond reason. This suspicion is confirmed by the author who says that there are some physicians who to save time are in the habit of delivering with the forceps, without the slightest reference to the stage of labour, and that—

"There can be no doubt of the fact that among the poor, in this city at least, the forceps are employed to a greater extent than would be permitted among the wealthier classes."

The doctrine of the author as thus far stated is but a small portion of the subject. Not only is laceration of the cervix unrecognized, but it is, or has been universally mistaken, when seen, for something else. En-

<sup>1</sup> *Indications for Hystero-Trachelorhaphy.* By Paul F. Mundé, *Amer. Journ. Obstet.* Jan. 1879.

<sup>2</sup> *Loc. cit.*

<sup>3</sup> Address on Obstetrics to Medical Society of Penna., May, 1878.

<sup>4</sup> *American Journal of Obstetrics*, November, 1874, p. 456.

<sup>5</sup> *Medical Record*, March 9, 1876.

larged and elongated cervix, ulcerations or excoriations of the os, granular and cystic degenerations, these are really lacerations of the cervix. Profuse leucorrhœa, discomfort upon standing, backache and pains in the limbs, irritation of the bladder, and marked nervous disturbances are the symptoms which make known the injury: these being present, an examination will reveal a laceration. Apparently there may be a granular erosion, or what is commonly termed ulceration, but on close examination it will be found to be laceration, the close examination consisting in drawing together the lips by tenacula, when a surprising diminution of bulk will be effected, and the true state of the case be revealed. The lack of recognition of this fact, and the lack of the special examination, explain why the lesion has been overlooked; the author confesses that for these reasons he himself formerly made the mistake and this is why "the profession to-day all over the world are cutting off and burning parts of the cervix which, if otherwise properly treated, would result in restoring the uterus to its normal condition."

In regard to the great value of the contribution to medical science which Dr. Emmet has made in recognizing this lesion and its pathological influence there can be no question. It is one of the most notable advances of gynæcology made in recent times, and has been so recognized by those most competent to judge. When the first paper was read upon the subject before the Medical Society of the County of New York, the operation for the relief of this injury as devised and executed by Dr. Emmet was spoken of in the highest terms, even as "perfect," by Dr. Sims, and upon his motion the thanks of the Society were tendered to the author for the contribution.

The value of the discovery is also attested by gentlemen of high position and large experience to whose papers we have already referred. These remarks apply to the well-marked cases of laceration. When it comes to the minor forms, to the cases in which, upon the author's own showing, it is exceedingly difficult to demonstrate a sulcus, or a division of the tissues, to cases such as those described on page 469 in which repair has taken place, and the operation is for the removal of a "cicatricial plug," there will be, we think, difference of opinion and dissent. The medical gynæcologists will hesitate to give in their adhesion to a doctrine which is ultra-surgical until it is most thoroughly proven to be true, men not as skilled in operating as the author, and all those who cannot command skilled assistants, will use all other measures before resorting to an operation which requires considerable skill to execute. Indeed the position of the author in regard to the etiological connection between laceration and subinvolution has already been challenged by very high and competent authority, and the ground taken that both are more probably the common result of some as yet unknown cause.<sup>1</sup> This part of the subject then, that is, the influence and importance of, and the necessity of operative interference for, the minor forms of laceration of the cervix, must remain open for decision, subject to the results of farther experience and the testimony of other observers.

The treatment of this injury follows in due course. First the preparatory, and this is to be continued many weeks, perhaps months, and is not different in general character from that generally resorted to by the profession in those (so-called) inflammatory affections and chronic conditions from which it seems so difficult to distinguish laceration. This fact is of prime importance, and must be ever borne in mind in forming a judgment

<sup>1</sup> Remarks at N. Y. State Med. Soc. 1878, by Dr. Fordyce Barker.

as to the author's doctrines, and as to the operation for this accident. In regard to the operation itself, it is minutely detailed, indeed "perfect." In reflecting upon the frequency with which the author resorts to it, and the high estimate he places upon it, the history of incision of the cervix for stenosis, dysmenorrhœa, and sterility, will force itself upon the mind, with the suggestion of "history repeating itself," a repetition of as wide a departure by the profession in this instance, as followed in regard to the favourite operation of the gifted Simpson.

The operation for laceration is closely allied to another—amputation of the cervix—and the subjects follow closely, indeed run one into the other. In the chapter devoted to this operation we find a still wider departure from the teaching of other gynæcologists and from generally accepted pathological doctrines. Thus the author lays down the law that there is but one condition of the cervix for which amputation is justifiable, and that is malignant disease. That as a remedy for laceration, for hypertrophy, or for elongation it is to be utterly and entirely rejected. As he is thoroughly in earnest there is no mistaking his positions; as he admits that he formerly operated for these conditions, and has discovered his error and changed his practice, there can be no question as to his honesty. The peculiarity of his position and of his teachings, however, do not end with what we have above stated; it extends even to a flat denial of the existence of hypertrophy of the cervix and of the elongated cervix.

"The commonest error of the day is a mistake in diagnosis between a laceration of the cervix and its supposed enlargement or elongation."

And these conditions, or what has been described as such, are simply cases of laceration which have been misunderstood, just as erosion or ulceration has been misunderstood! What would Cruveilhier and Huguier say to this? and what are we to do with the illustrations, "*ad naturam*," of our text-books, even after we have disposed of the doctrines of all our standard gynæcologists? The long and pointed cervix which has been so fully recognized as a cause of sterility comes likewise under the ban: "I will no doubt be reminded of certain cases of supposed elongation of the cervix found in unmarried women, but I deny that such a lesion exists," p. 479; which is somewhat qualified on p. 482 by the statement—"I am almost prepared to deny that such a condition as elongation of the whole cervix ever exists; it certainly is never found in a woman who has ever been impregnated."

Where opinions differ so widely, one side or the other must be wrong, and if wrong the mistake cannot be either trifling or harmless. This position is fully accepted by the author:—

"I advance the statement, without qualification, that this operation [amputation of the cervix], as at present applied, is to a greater extent a malpractice, and is attended by more evil consequences than any other procedure now resorted to in this branch of surgery."

He is never particularly mild on the profession, and here is especially severe, including, of course, other gynæcologists:—

"It is equally true to-day that the profession all over the world are cutting off and burning off parts of the cervix, which, if otherwise properly treated, would result in restoring the uterus to its normal condition."

Of course such statements are beyond criticism. When an author absolutely denies the existence of a thing, such as an elongated cervix in a nulliparous woman, he so flatly contradicts what we believe we have

learned by actual observation that we do not know what to think. This, however, we may justly say: when a writer is so particularly emphatic upon a point, he should begin by carefully defining his terms and giving his measurements. Thus, as we nowhere find stated at what length a cervix should be considered to be an elongated cervix, it is possible that the author, and those who differ from him, may be thinking of two conditions not widely different, and might agree perfectly as to the terms to be applied to cases under actual observation. For there is a distinct recognition in the book of elongated necks! thus, on p. 353, we read of cases in which the "neck is unusually long," and on p. 354 of an operation being necessary "whenever the cervix is of unusual length," and on p. 361 that "a long cervix is sometimes the cause of retroversion," and there are many other instances.

Evidently these views of the author have met with opposition, and this has, perhaps, led to an exaggerated statement of them; undoubtedly some such influence has been at work, or he would not have been betrayed into such unfortunate paragraphs as the following:—

"I have not deceived myself, nor do I exaggerate these statements in the slightest degree. Yet their truthfulness will be questioned, I have no doubt, by two classes, equally conscientious in their position, viz., those who are too indolent to thoroughly investigate the merits of the case, and those who remain in ignorance from having already reached an age (varying with all of us) at which we cease to appreciate new ideas."

This will hardly ever do in anything—it will never do in science. Denunciation of those who do not accept new doctrines never aided their spread. We could add to the above a large class, not too indolent to investigate, as earnest and as honest as the author, always willing and even glad to receive all new doctrine when it is proven to be good. They will hesitate to accept the views here presented until the verdict of further time and other observers, already alluded to, has been rendered. That having been given in their favour they will most cheerfully accept the operation and not be backward in practising it.

These points and these peculiarities render this chapter, in our opinion, the most unsatisfactory of the work. As there is one part to which we do not know what to say, there is another which we do not understand. We allude to the description of the behaviour of certain uteri as given on pp. 482–3. We cannot gainsay the facts observed by a competent observer; we are acquainted with delineations of lengthened uteri in standard authors; we are not prepared to deny that such uteri draw out and contract like a telescope; but when they do so, we cannot understand why the lengthening should occur when the woman stands up, and the shortening when she is placed in the knee-elbow position—in both instances the movement being directly against the force of gravity.

In noticing the practical part of the work, we have chosen those portions which presented the most salient points of attraction, which have shown the widest departure from accepted views, or illustrated the author's peculiarities of doctrine or practice. Much of the best part of the work must be left unnoticed, or simply referred to our readers as worthy of their closest attention. The chapter on ovulation and menstruation is one of the best physiological chapters of the work, and is the most important and valuable contribution to the study of these important subjects of recent times. Uterine flexions and versions are studied at such length that their consideration would lead us too far. Procidencia and pessaries receive

the attention they deserve. In regard to the latter, the author holds so exclusively to original ones formed from block-tin rings, that we think that the omission of some hints for guidance as to choosing among the legion before the profession will be felt as a lack which might have been easily supplied. We may further say of the pessary figured on p. 373, and after which fancy has no further forms to furnish, that if it so often fails, from being made of too large-sized wire, then the exact size of wire required should have been given.

The treatment of fibrous growths of the uterus is especially full and indispensable to every operator, and the same may be said of the chapter on cystitis and the operation for its remedy, a subject with which the author's name is indissolubly connected. To vesico-vaginal and rectal fistula nearly one hundred pages are devoted, in a manner which might be expected from the well-known monograph by the author, already before the profession, and we only allude to the subject to call attention to the deep debt of gratitude due to Dr. Emmet for his labours in this direction. The position of the consulting and operating obstetrician is often most embarrassing. Called in at a late hour to neglected labour cases, he finds instrumental assistance imperatively required, and renders it. If, then, a fistula follows, it is charged by the friends of the patient to his active interference rather than to the neglect and delay where it properly belongs. The author was the first in this country to direct attention to the true relation of cause and effect whereby many a member of the profession has been relieved of unjust blame. We say "in this country," because the opinion was expressed as long ago as by the elder Oslander, and even before him by Dubois, but their testimony seems to have passed out of the memory of the profession.<sup>1</sup> Dr. Emmet is the first anywhere to furnish indubitable statistical proof in regard to the matter.

We regret to notice a good many errors in words scattered through the book. The most of them are of little consequence, but this cannot be said of the use of "aconite" for "digitalis" on p. 281. We looked for and hoped to find a correction of this in the list of errata, but do not. We assume it to be an error, although twice repeated, because not only do we know of no authority for such a use of aconite, but, according to all teaching, aconite is a dangerous remedy in such conditions.

We commend this book to the profession, with the assurance that it is well worthy of their most careful consideration. It contains much that is new, some things that are not yet accepted, and some that will give rise to controversy and perhaps excite opposition. Although it has some weak points—and what book has not?—yet it contains a vast amount of most valuable matter—of matter that is positively good and eminently practical. For several reasons which we could mention, we do not believe it to be the best book for elementary study, but for the practitioner it is admirable, and no one giving any attention to gynecology can afford to be ignorant of its doctrines or of its practice. It is a book to be studied rather than read, but it can neither be read without interest nor studied without profit. We believe the profession will receive it in the spirit in which the author proffers it in his preface, as the lifetime work of an earnest, honest, devoted, and conscientious man.

J. C. R.

<sup>1</sup> Handbuch der Entbindungs-Kunst, iii. pp. 143, 144. 1825.

ART. XIX.—*Iconographie Photographique de la Salpêtrière (service de M. Charcot)*. Par BOURNEVILLE et P. REGNARD. Part 2me. 4to. pp. 234. Plates. No. xxxix. Paris: V. Adrien Delahaye & Co., 1878.

M. BOURNEVILLE is known to American readers as the intelligent and industrious assistant of M. Charcot. It is he who has systematized and edited his famous teacher's work; but while doing this he has himself added greatly to the value of the material which has passed through his hands, and his own researches in hystero-epilepsy, sclerosis, etc., are scarcely less valuable than those of M. Charcot; consequently in the volume before us we naturally expect to find a great deal that is new and good, and we are not disappointed.

Bourneville and Regnard have been engaged during the past two years in photographing the patients at La Salpêtrière, and their results form the basis of the work. There are in all thirty-nine plates, prepared by a new process of photo-lithography, a photographic impression being first made upon the stone in a dark chamber, and this stone is used with a fatty ink, as in the ordinary lithographic process. The plates are consequently very faithful copies from originals, but as it is next to impossible to obtain a sharp picture of such patients as those figured, because of their constant agitation, it has been found necessary to retouch to a great extent. This procedure, however, takes little from the value and accuracy of the picture.

The plates illustrate two forms of nervous trouble, the first of which is *partial epilepsy*, the second *hystero-epilepsy*, and besides these illustrations of a lithographic character, there are several wood-cuts distributed through the text.

The first half of the volume is devoted to the consideration of partial epilepsy, which is a term used by the author in the same sense that it is by Hughlings-Jackson, to indicate a local cortical discharge. Most of the cases brought forward by Bourneville are those which we have been taught to consider under a variety of names, such as atrophy of the brain, post-hemiplegic chorea, athetosis, etc. etc., with the addition of the epileptic element.

Bourneville divides partial epilepsy into three varieties:—

1. Partial hemiplegic epilepsy—that form in which the paralysis and other troubles begin early in life. The phenomena of the attack resemble those of common epilepsy, with this difference, that the convulsions are limited to the paralyzed side.

2. Partial tonic epilepsy with contractures.

3. Partial "vibratory" epilepsy.

In illustration of the first form, two cases are given. The first presented cerebral atrophy with right hemiplegia (patient supposed to have been born with the paralysis), epilepsy appearing at 12; the paroxysm always preceded by aura beginning in paralyzed side, after which the hand and arm of this side become agitated by convulsions. The patient next becomes unconscious; vertigo at times. The second patient presented this history: convulsions at 17 months; left hemiplegia; appearance of epilepsy at the 12th year as the result of fright; aggravation of the attacks at 22; gastric crises; migraine; disturbances of sensibility, etc.

In both of the subjects the convulsions which began in the paralyzed side were characterized by three stages, a tetanic, a clonic, and a ster-



torous, and there was an elevation of temperature. The convulsions varied in duration from ten to fifteen minutes.

This class of cases includes those of a kind dependent upon an inflammatory cerebral lesion. There may be a disappearance to some extent of the initial paralysis, but there remains afterwards a feebleness and uncertainty of movement, until at the end of a year or so when there is the accession of epileptic symptoms limited to the weak side only; after them remains a species of secondary lasting hemiplegia. This is the abstract of an illustrative case:—

“At the age of twenty-five months Per— was attacked with convulsions, which lasted nine hours, confined to the right side of the body, and involving leg, arm, and mouth. On recovery, she was found paralyzed, and could not move at all the arm or leg of the paralyzed side (the right). Three months afterwards she was found to have regained some of her lost power, but her limbs were rigid, and a marked stiffness was observable at the end of the fourth month. At four years and a half she became again attacked with convulsions, which lasted for four or five hours, the movements being confined to the right side; complete flaccidity, followed after a time by a return of the rigidity. When five years of age there was a third illness, lasting twelve hours, in which the convulsions again appeared on the right side, with fresh paralysis and rigidity. The hemiplegia is complicated with athetosis.”

Certain features of the disease are prominently mentioned. We are told that the upper extremity is the seat of more profound and obstinate contracture than the lower, and so with the convulsions, which nearly always begin in the superior extremities. Joint pains and arthropathies almost always follow the paralysis. The shoulder and elbow are the seat of lively pains, which are increased with sudden variations of temperature. The atrophy both of muscles and bones is decided on the paralyzed side. The muscles ordinarily retain their electric contractility.

In the third group of this first class of cases these paralytic and epileptic manifestations are connected with certain varieties of movement more familiarly known as hemi-chorea and athetosis. The latter Bourneville believes to be a symptom only, and not a disease having peculiar and distinctive characters. This localized disturbance of motility occurs, as Bourneville thinks, in many cases of cerebral atrophy, and this is probably the opinion of most neurologists who have had much experience with chronic nervous cases at hospitals. Indeed, the “athetoid” symptom is by no means as rare as certain authors would have us believe. There is a hyper-extension of the fingers in many of these cases at one part of the local “athetoid” movement, and this, with a certain vermicular slowness of extension and flexion, is its only peculiarity. The objections of Charcot to Hammond’s term are presented, which go to prove what all neurologists have appreciated, viz., that “*athetosis*” is a misnomer; for the movements described by Hammond are not confined to the hands and fingers, but are to be witnessed in other parts of the body, the foot, arm, face, and neck muscles being agitated in certain cases. In the majority of Bourneville’s cases the appearance of the so-called athetoid movement was from fifteen to twenty days after the convulsive attack.

Upon page 40 the differential diagnosis between these various movements is clearly drawn, but there is little presented that is new. The mental peculiarities of some of these patients are noted and illustrated. Plates V. and VI. represent an imbecile, with right hemiplegia and contracture; Plate VI. *bis* represents arthropathic changes in the right upper extremity.

It was found by Bourneville that the epileptic cry is usually absent; that the clonic convulsions are nearly always limited to the paralyzed side; that they are more violent and less prolonged when they affect the sound side of the body. Frothing at the mouth is rare, and involuntary micturition still more so; the period of stertor is short, and this condition not at all profound, while the patients regain consciousness without the delirium which is found in ordinary cases. Trembling usually succeeds the attack, and is an interesting symptom. The disease in many of the cases lasted ten, fifteen, or twenty years, and occurred as often sometimes as eight or ten times a day. The attacks were both diurnal and nocturnal.

The second grand division, viz., partial epilepsy of a tonic character with contracture is illustrated by two cases. The points of the attack in one case are briefly as follows:—

An *aura* consisting of vertical pain in the head, confined to the left side, and accompanied by throbbing; epigastric pain and violent palpitation preceded the convulsive symptoms. The last three fingers of the right hand became cold, and the seat of trembling. The face became pale, and bore an anxious expression. She sought a chair, appearing dazed, and complained of flashes of light shooting before the eyes; the eyes were spasmodically closed. The attack began by contraction of the muscle of the right side of the neck, which drew the head to the corresponding shoulder. The eyelids were closed and agitated by slight movements. The pupils were dilated. She did not lose consciousness, and the face was constantly turned to the affected side of the body. The right arm was contracted in extension and pronation, the hand being bent at a right angle with the arm. The index finger and second finger were extended, while the others were semi-flexed. The right inferior extremity is often contracted in extension, but less intense than in the arm. These different symptoms, which constitute a species of primary phase, last a minute; then the patient turns in her chair from left to right, the head remaining always inclined towards the right shoulder, but the chin is directed towards the sternum. At this moment the anterior part of the body is drawn towards the back of the chair, the forearm is flexed at a right angle on the arm, and is drawn across the dorso-lumbar region. At the end of two or three minutes the patient rotates in a contrary direction—from the right to the left—that is to say, the original position. The eyes open, the forearm is extended violently, all the other symptoms disappear, and she asks for a drink of water, the teeth clattering on the edge of the glass. These attacks last for two or three minutes—sometimes for five or eight minutes, and there is a rapid return to the normal condition.

The third variety, the vibratory partial epilepsy (*l'Epilepsie partielle vibratoire*) is quite rare. The features of the disease are illustrated in the case of Marl. At four and a half years of age she had an attack of convulsions announced by crying, grimaces, etc., and after these prodromal symptoms she became convulsed and remained so for thirteen hours. During this time the movements were confined to the *right side of the face and body*. The discharge of urine and feces was voluntary. After these convulsions she went out to play as if nothing had been the matter. About a year later M. had convulsions lasting an hour, which again affected the right side, leaving after them a certain degree of paralysis which caused the child to drag the right leg. The paralysis of the right leg was not

aggravated during the first year and a half to the sixth year and a half, and the right upper extremity was free. Her intelligence was unaffected, and developed naturally, and she was sweet tempered and affectionate. Six months after this she became irritable, and the right leg became the seat of jactitations for thirty seconds at a time. There was no loss of consciousness, no cry, no frothing at the mouth. Later on these attacks became more frequent, and were preceded by irritability. They subsequently grew stronger and next the right arm became the seat of "vibrations," and finally the left side of the body became involved. At this time there was loss of consciousness, which lasted from one to two minutes. These attacks were nocturnal and diurnal, but predominated during the day. Two cases of this kind are given, and in the second case two or three plates are presented which illustrate the phases of the attack.

These then are the three forms of partial epilepsy, though strictly speaking the second form is not an epilepsy at all, for there is no loss of consciousness. In the others the relation of the convulsive attacks to the primary nervous condition is sufficiently near to bring it into the case as a part of the pathological process. Heretofore such cases were spoken of as "*Hemiplegia with epilepsy*" or "*Hemiplegia followed by athetosis*," and very little importance was attached to the convulsive character of the post-paralytic state. Now an entirely new interest is given to the disease picture, much of which arises from the connection of such phases of exaggeration or disordered motility with lesions of the cortical centres. Thanks to Hughlings-Jackson, these patients, who before were the least interesting of all chronic hospital cases, become subjects of the most attractive kind of study.

The second and most important part of M. Bourneville's work is that which considers hystero-epilepsy. Charcot and Bourneville were, without doubt, the first persons after Briquet to study and describe this most dramatic and curious disorder, and have succeeded in attracting general and unusual attention to the little group of patients of this kind gathered at La Salpêtrière. Before the early *leçons* of Charcot, these particular phases of hysteroid disorder were not recognized as distinct, and all such cases were roughly grouped under the head of "hysterical convulsion." A few years later Bourneville described more carefully and fully the cases of "Ler," "Etehr," and others of Charcot's patients, and within the past year or two they have been seen and examined by Ernest Hart, Sigerson, Dumontpallier, Luys, Westphal, and others, who have described the attacks, and metallo-therapy, and have attested to the wonderful character of the disease.

These descriptions are too familiar to need repetition, and in a review of this kind any extended criticism of the subject would be out of place, for M. Bourneville's book is but an admirable recital of the clinical feature of hystero-epilepsy, and he does not enter into the consideration of its pathology. It may not be amiss, however, to briefly call attention to the peculiarities of the disease, which, as we know, is a peculiar combination of epilepsy and hysteria, the convulsive element predominating at times, and the psychical at others, and as a result of this mixture we find a series of attacks beginning with tonic and clonic convulsions, stertor, and delirium, and separated by periods of repose which have varying duration. These attacks occur as repeated paroxysms, sometimes numbering several hundred, and are produced by exciting causes such as sudden emotional disturbance, visual stimulation by bright light, the patient being made to look fixedly at a calcium or electric light, or by pressure upon some parts of

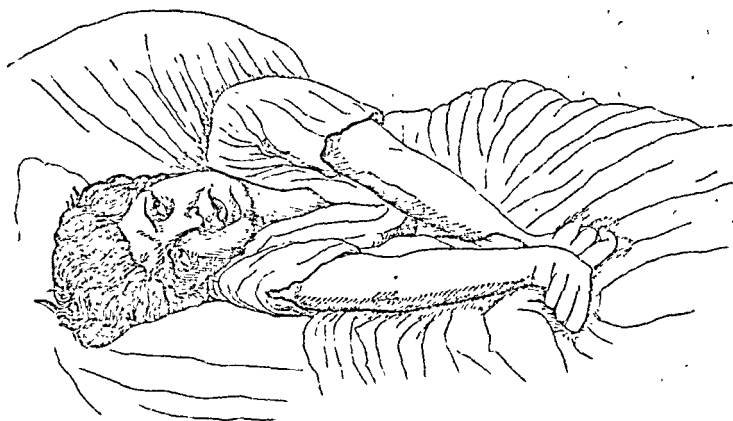
the body, such as the spine, or the mammæ which are especially sensitive; and so much so as to have given rise to the mistaken diagnosis of cancer in times gone by. In the two cases which form the chief part of the volume before us, and if our memory serves us aright, in nearly all of M. Charcot's previous cases, there has been a groundwork of the most dramatic description. This is especially the case in the first patient presented by Bourneville, in whom a history of early neglect, orphanage, seduction at fifteen by a man of seventy, who drugged her, etc. etc., make up a truly sensational story. Other women have been prostitutes, and others were apparently insane. In these as well as in other cases there is a suspicious element of fraud upon the part of the patients indicative of an inclination to deceive, which may be and is purely involuntary. This has its counterpart in men and women all of us know, who lie as naturally as they eat or drink, and have no conception of their unfortunate failing, while they very rarely have anything to gain by falsehood. In the hystero-epileptic patient, and in fact in the aggravated hysterical patient, misrepresentation and untruthfulness become secondary moral habits. This we have seen in a young woman who expressed every desire which seemed earnest to eat, but would not swallow, or retain any article of food she took herself, though she cried for hours because of her demoralization and weakness, but retained what was forced into her stomach and obeyed the directions of any person of stronger will. Consanguineous marriages are not considered by Dr. Bourneville to have much to do with the development of this state, but sexual vices, menstrual disorders, and various nervous diseases of the parents are held by him to enter into its proximate or remote production. In this connection it may be well to allude to Bourneville's statement that he has observed that nightmare and bad dreams in childhood have played an important part in the etiology of the affection.

The prodromal features of an hystero-epileptic attack are ovarian hyperæsthesia, the globus hystericus, cardiac palpitations, constriction about the neck, noises in the ears, violent beating of the temporal arteries, obscure vision, etc. The immediate attack is ushered in by irregular respiration, oppression and dyspnœa, awkwardness of speech, amounting to embarrassment, of which the following example, which occurred in one of our author's cases, may be presented. After the prodromal symptoms described above, the patient, with hesitation and difficulty, enunciated the words: "J'ai . . . l'a . . . respiration . . . dif . . . ficile . . . se . . . ne . . . serai . . . pas . . . malade . . . afin . . . de . . . pas . . . avoir . . . de nitrite d'amyle," in the way they are written. Some tumultuous heaving of the belly then follows, the eyelids palpitate rapidly, the look becomes fixed, the pupils dilated, the gaze is fixed upon some object above, and then she loses consciousness.

The actual attack is characterized by an initial stage (*the tonic phase*) of tonic convulsion. The entire body becomes rigid, the arms being usually stretched out, and the hands turned in; there is a movement of circumduction of the hands and forearms, the arms being drawn across the body, and the back of the hands brought together, so that the knuckles are approximated (see Fig. 1). The inferior extremities are stretched out, and drawn apart, the feet being in the position of equinus varus, but in other cases the feet may overlap each other, the toes being strongly flexed. The face is contorted and suffused with blood, and the mouth is often widely opened, or in some cases tightly shut, the lips being compressed over the teeth. Res-

piration is suspended, the pulse is with difficulty perceived, and the belly is immobile and contracted. The next phase is that characterized by *tetaniform* and *clonic spasms*, the head, which was drawn downwards and to one side or backwards, returns to its normal position, the facial muscles become seized with clonic spasms, and the eyelids are opened and shut violently but somewhat slowly. A *stertorous phase* supervenes, the face

Fig. 1.



becomes covered with large drops of sweat, the respiration grows noisy and violent, and there is frothing at the mouth. A period of repose then follows, when the respiration appears regular; there are movements of swallowing, abdominal gurglings are heard, and undulations of the abdominal walls become apparent. The *clonic phase*, which has been described as the "stage of contortion," is expressed in two ways, which sometimes succeed each other in the same attack. 1. In clonic movements of the limbs and head, which is rolled from side to side. The face is red and engorged with blood, the neck is stiff, and the arms are stretched out and contracted, and after a time the patient falls violently to the bed, arising and falling again several different times. At the same time the rigidity of the arms disappears, little by little.

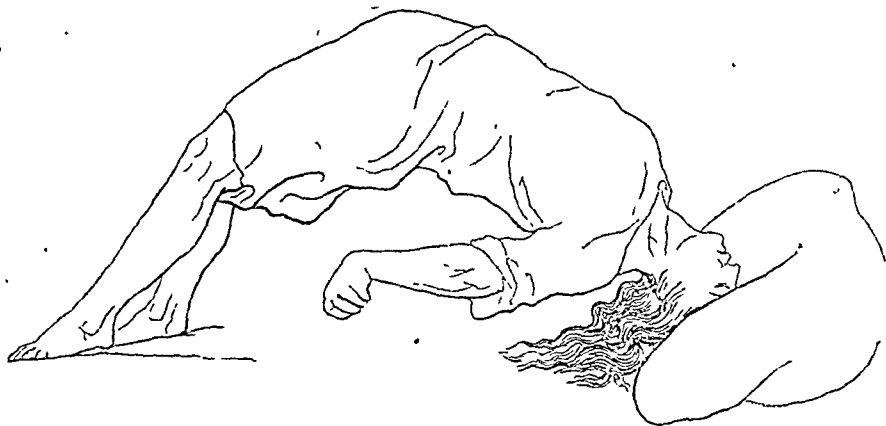
2. "The mouth is widely opened, the tongue is protruded; she moves rapidly to the side of the bed crying oh! oh! (*oue! oue!*) The body becomes curved in opisthotonos (see Fig. 2). She rests on the back of the head and feet, the hair is dishevelled, the legs are convulsed and agitated by alternate movements of flexion and extension."

A new period of repose follows.

By far the most interesting phase of the disorder now makes its appearance, viz., the *period of delirium*, and much of the attractiveness and interest of the volume before us depends upon the great number of beautiful plates which depict the various changing expressions in the emotional gamut. Artistically they are of value, for in no other way is it possible to obtain such vigorous, rugged portrayals of natural emotion so necessarily devoid of artificiality. Psychologically they are interesting as involuntary exhibitions of unbridled emotional excitement, just enough intellect remaining to serve as a basis for the activity of the ideational centres. In Dr. Bourneville's patients, and in fact those of other observers, the incidents of the previous life figure conspicuously in the delirium, and though there is a tendency to the formation of causeless hallucination of

the horrible kind, in which reptiles, and such small animals as rats and cats figure at some stage, there is an old impression which serves as a field for the development of a delirium which is exhibited by gesticulations and facial expressions of fear, ecstasy, anger, mockery, erotism, and grief.

Fig. 2.



The patient at this stage assumes an attitude and expression indicative of her emotional condition. She may remain lying upon the bed, her body inclined to one side, her arms resting by her side, her face upturned and wearing a beseeching look, which constitutes the "Attitude Passionelle" of *Appeal*. At another time she clasps her hands, sits up, turns her face upwards, and gives expression to words of supplication, such as these; "Tu ne veux plus? Encore . . . !" this being the "Supplication Amoureuse." At other times the patient lies upon her back, her arms crossed over her breast, and her face wreathed with a most sensuous smile (*erotisme*). Again, the attitude *Menace* is represented in four plates, showing a rather pretty young woman in the half erect posture, with clenched fist and clouded brow, giving utterance to such words as "Vilaine bête!" or "Sale bête! Pignouf! . . . Est-il permis?" while she strives to catch the unpleasant figure which torments her. "Infâme! Lâche!" and she launches forth into a string of hearty invective. It would indeed be a protracted and difficult task to enter into the extended discussion of these various interesting and peculiar expressions of delirium, and the reader must consult the work itself if desiring an exceedingly amusing and curious study.

The variations of the delirium do not seem to be at all regular in their mode of appearance or constancy, but there is a general similarity in the form of emotional excitement and method of expression, and from an inspection of either of the cases, it would appear that for several days at a time there were convulsive attacks followed by delirium, in which scorn, mockery, fear, amorous ecstasy, subsequent repose, and either a return of the delirium, or fresh convulsions, occurred.

There may be fifteen or twenty attacks in twenty-four hours, or even many more, and some of these are aborted or irregular, at such times the only manifestations being those of a purely psychical nature; the synopical attacks being examples of this kind. In rare cases the *clonic phase* (or period of the grand movements) is followed directly by the extension of the arms at right angles from the body, so that an appearance is presented which has been called *Crucifiement*, or the position of crucifixion.

This is usually associated with the portrayal of various ecstatic states, which are termed by Bourneville *béatitude*, etc. The first of these is most strikingly portrayed in the plate which is here reproduced (Fig. 3).

Fig. 3.



A feature of Observation 1, is the complication of chorea, which was manifested at different times in the course of the disease. It was of a rhythmic character, and involved the entire body, so that the trunk was drawn backwards and forwards, the forearms were flexed and extended, the hands were pronated and supinated alternately, and the legs and thighs flexed and extended, the right eyelid became closed, and the muscles of the right side of the neck were convulsed. This occurred in paroxysms, and was modified under ovarian pressure, the movements becoming less violent, and finally ceasing. When the compression was suspended, the movements began anew, and a violent contraction of the right arm and leg, which had lasted during the maintenance of pressure, disappeared. Ether was given, and again the movements were suspended, but a fresh contraction of the limbs of the right side took place. The behaviour of the chorea during the time the patient was subjected to various forms of treatment, is admirably detailed upon pages 158 and 159.

In one or other of these cases hemianæsthesia and ovarian hyperæsthesia were observed from time to time. Contraction of various organs was quite frequent, and was sometimes provoked by ovarian pressure; as in the case just detailed, and different visual disorders, such as amaurosis and disordered colour sense, were discovered, while hallucinations of vision were prominent in both cases.

Very little is said about treatment, and our attention is directed chiefly to such agents as nitrite of amyl, chloroform, ether, or valerianate of ethyl which stop the paroxysm. Ovarian pressure by means of the apparatus

like that occasionally used for the purpose of compressing aneurisms, is spoken of, and a plate is added to the text. Two hard pads, one of which has a concave surface to grasp the ovary, are used by Bourneville, and the use of this compression has been attended with interesting results, chiefly, however, of a scientific nature.

Metallo-therapy is spoken of occasionally, but very little is said in regard to this curious method of treatment, and we suppose the author's investigations are to be described hereafter.

The last case described by Bourneville is that of Génevieve, a *succube*, and those who have read the elder Balzac's story in *Les Contes Drolatiques* will enjoy the details of this case. Génevieve, whose portrait (Plate XXXIX.) represents a very melancholic, middle-aged woman, presents an example of demoniac possession, with certain very curious modifications of sensation. The feature of this patient's disease resembled those of Madeleine Bavart, who believed that she was visited by the Devil, who took the form of a cat; and in both of these cases the hallucination resembled very strongly those of delirium tremens, in which rats, cats, serpents, and other animals form the basis of the visual hallucination.

Numerous details of many interesting cases of demoniac possession are presented, and form a very attractive part of the book.

The peculiar surroundings of all of Dr. Bourneville's patients have been such as to lead to exaggerated manifestations of all kinds; in fact these women have been so frequently exhibited, "put through their paces," and commented upon, that the speculation immediately arises in our minds as to what might have been the character of the early attacks, and the possible difference from those presented during their career at La Salpêtrière, which are described by our author. This matter is worthy of consideration, and has much to do with the significance of the delirium stage. Then, again, a query suggests itself in regard to what might be the possible difference between attacks of hystero-epilepsy in women of other countries, who are not so emotional as the French, and whose religion is not so closely incorporated with the affairs of every-day life as it is in Roman Catholic countries; and this leads to the question whether hystero-epilepsy in Norway or Sweden, England or America is so marked by ecstasy, religious frenzy, and so often presents the "crucifiement." The few English and American cases do not show this. Dr. Thos. Anderson<sup>1</sup> reports a case in which there are none of the religious manifestations so frequently displayed in the French cases; and in cases reported by the reviewer<sup>2</sup> the absence of this phase of the delirium is the rule, but in a case since seen, the patient being a devout Catholic, the "crucifiement" is often presented. This is certainly suggestive of the fact that the delirium is almost entirely influenced by previous circumstances, belief, etc. The advance in our knowledge of these peculiar psycho-neuroses is certainly a great one, and these and other histories are of decided value in showing how many of the extraordinary religious beliefs of the past, and the superstitions of the present time, are entirely dependent upon complicated diseased states of the body and mind. We are consequently enabled to argue from much more firm and definite premises, when we appreciate the relationship (especially of the former) with these manifestations. The curious results of ovarian pressure, the provocation of the attack by bright lights, and pressure, such as has been described by Sigerson as *crisogenic*,<sup>3</sup>

<sup>1</sup> British Medical Journal, Feb. 8, 1879.

<sup>2</sup> Nervous Diseases, their Description, etc., Phila., 1878.

<sup>3</sup> British Medical Journal, 1879, vol. i. pp. 145, 151.



supplies the link in the chain which is in connection with the bodily nervous trouble at one end, and mental disorder at the other.

Heretofore our arguments were to a great extent purely metaphysical, and consequently we were little better off than our opponents, who advocated the possibility of possession good or bad, who believed in the miraculous and the nonsense so dear to the credulous mind in search of mystery. What an amount of bigotry, folly, and injury to weak minds is counteracted by the discoveries and investigations of MM. Charcot and Bourneville it is not difficult to imagine. The false lessons inculcated by designing persons who have used the disordered bodily and mental states of stigmatisation, ecstasy, and the legion of dramatic hystero-epileptoid symptoms for purposes of deception stand a good chance of being completely and universally neutralized.

A. McL. H.

#### ART. XX.—*Cerebral Localization.*

*Lectures on Localization in Diseases of the Brain.* By Prof. J. M.

CHARCOT. Edited by BOURNEVILLE. Translated by EDWARD P.

FOWLER, M.D. 8vo. pp. 133. New York: Wm. Wood & Co., 1878.

*The Localization of Cerebral Disease.* By DAVID FERRIER, M.D.,

F.R.S., etc. 8vo. pp. 142. New York: G. P. Putnam's Sons, 1879.

*Revue Générale des Sciences Médicales. Art. des Localisations Cérébrales Corticales.* Par H. RENDU. pp. 298. 15 Janvier, 1879.

No subject during the last five years has attracted more intense and widespread attention from the medical world than that of cerebral localization. Rendu leads his admirable review with a list of more than a hundred works and articles published within three years. It is the great living question. Physiologists, pathologists, and physicians are deeply interested in the facts collected and the issues involved. We have a new phrenology, which is presented as a science and a system based, not upon crude speculation, but upon careful, laborious work, the value of which is not to be measured altogether by its direct fruits, whatever they may be. The names of Charcot and Ferrier, whose books are before us, are pre-eminent in the recent and important era of cerebral investigation.

The books of Charcot and Ferrier, although similar in title, are by no means alike in contents. Ferrier's volume, as the author states in his prefatory note, is the complement from a clinical and pathological standpoint of his former work on "The Functions of the Brain;" Charcot's contains matter essentially different from both of these. From the three works a complete idea of the subject of localization can be obtained.

Both books are issued in excellent style, and with illustrations so good that he may run that reads the lessons which they teach. Dr. Fowler's translation is indorsed by Charcot himself as a model both of scrupulous exactitude in rendition of the original meaning, and as a clear and unexceptionable style of English. No physician who aspires to keep pace with the advance of his profession should be without these works.

Charcot's lectures, here presented, are only the beginning of an extensive series; but his preliminary work is of the very best character. They constitute an elaborate anatomico-pathological study of the brain, an "exposition of the principles underlying the doctrine of cerebral localization." The encephalon is well discussed from a morphological point of view; a

brief parallel is drawn between spinal and cerebral lesions; the cerebral circulation is dealt with by the most lucid of methods; hemianæsthesia, amblyopia, and hemiopia are examined; and secondary degeneration receives a short but satisfactory setting forth.

In his opening lecture, after a few introductory remarks, he explains the shape and plan of the brain. Ganglia, lobes, convolutions, and connecting tracts are clearly described, and the importance of an appropriate nomenclature is strongly emphasized.

The peculiar structure of the gray substance of the brain, discussed in Lecture II. and Lecture III., speaks strongly for the probable truth of the doctrine of specific localizations. We cannot do better than present some of the most prominent facts in regard to the histology of the convolutions.

In the first place, the gray substance shows certain general characteristics, being made up essentially of the same elements; but important relative deviations may be presented according to the region observed. The ganglionic, or nerve-cells, are the special elements of the gray cortex. These are in every way comparable to the motor cells of the anterior cornua of the spinal cord. They are generally spoken of as the pyramidal cells. They are variable in dimensions, most of them being relatively very small. They are usually arranged into three classes, according to size. The largest are called giant pyramidal cells, and have been carefully studied by Betz and Mierzejewski; they are found in certain well-determined regions. Their diameters sometimes equal those of the cells of the anterior horns of the cord. The essential structure of all pyramidal cells is the same. They have numerous prolongations. Each contains a nucleus and brilliant nucleolus.

Besides the pyramidal cells, small globular cells, sometimes furnished with prolongations, also exist in the gray cortex. These are generally sparse, although sometimes they form a tolerably thick layer. Some regard them as incompletely developed nerve-elements; others compare them to the constituents of the granular layer of the retina.

Meynert ranks also among the nerve-elements of the cortex a kind of elongated, generally fusiform, ramified cell, which probably belongs to the system of fibres which connects the convolutions.

An amorphous cerebral tissue, the neuroglia, serves as a uniting substance. This resembles the type of ordinary conjunctive tissue, conjunctive fasciculi, and flat cells. These elements which compose the gray substance are arranged in certain methods. The most common type of arrangement is that which is met nearly everywhere in the anterior lobes, and which presents five successive layers. Charcot's description and exposition of these five-layer stratifications of cellular nerve-elements are highly suggestive as regards the probable functions of different districts of the cortex.

The regions remarkable for the existence of the giant pyramidal cells are precisely those in which, in the monkey, according to Ferrier, the psycho-motor centres of the limbs are located. These comprise the entire ascending frontal convolution, the superior extremity of the ascending parietal convolution, and the paracentral lobule.

Some points of great interest are cited by Charcot in connection with the histological study of what he terms "the department of the *giant pyramidal cells* or the *motor cells par excellence*." He gives, for instance, Lander's case of infantile spinal paralysis, in which autopsy revealed that the ascending convolutions were much shorter and less developed than normal, and that the paracentral lobule was entirely rudimentary. Landers believes that the development of the psycho-motor centres had been

arrested. The case of Luys is also quoted. In a subject in which amputation had been performed some years previous to autopsy, atrophy of the convolutions on the side opposite to the amputation was observed.

We have now in our possession a brain-specimen, awaiting microscopical examination, in which the ascending convolutions, paracentral lobule, and portions of the hemisphere posterior to the ascending parietal convolution, are notably atrophied and discoloured. The patient had had his leg, of the side opposite to that upon which these cerebral changes appear, amputated at least twenty years before his death.

An experimental observation of Soltmann is referred to by Charcot, to the effect that with newly born dogs the excitation of the psycho-motor regions produces no muscular movement in the corresponding limbs, whereas, some time after birth, towards the ninth or eleventh day, these points become excitable. Similar observations have been made since the publication of Charcot's lectures, and we incline to attribute to them great value. The fact that age, habits, and mode of life may greatly influence the size and development of encephalic centres has many important bearings. Recognizing its truth, we can account for some of the apparent anomalies and variations in size and position of centres in reported cases. The remarks with which Charcot terminates his consideration of this part of his subject are so full of suggestive interest that we cannot forbear quoting them :—

“The regions of the large cells belong to the five-layer type, and these regions have no definite anatomical characteristics except the presence of giant-cells. Now these giant-cells, morphologically, do not differ essentially from the large pyramidal cells, which also, according to the researches of Koschewnikoff, possess, like them, the nerve-prolongations in addition to the protoplasmic prolongations attributed to motor-cells.

“It seems natural to inquire if these cells, and even those of the smaller species, which are their miniature representatives, would not be capable, under certain conditions—under the influence, for example, of abdominal functional excitement—of acquiring development, and in that way giving birth to supplementary motor centres destined to replace primitive centres that by some lesion may have been destroyed. Thus, for example, might be explained how voluntary movements can be restored in a part, notwithstanding the destruction of a motor centre—a phenomenon an example of which is furnished in the frequent recovery from aphasia, in despite of the persistence of the lesion of the third frontal convolution.”

The study of the cerebral circulation in the second part of Lecture IV., and in Lectures V., VI., VII., VIII., and IX., constitutes the most valuable portion of a valuable book. The vascularization of the encephalon is a subject of deep scientific interest, and, at the same time, of the most direct practical importance. The medical man, imbued with the proper spirit, can scarcely be engaged in a work more profitable and fascinating than the investigation of the arterial distribution of the brain. Charcot borrows largely from the work of Duret, a privilege to which he is certainly entitled, as this work was executed in the laboratory of Salpêtrière. At the beginning of his lectures on the arterial circulation in the brain, he steps aside to champion, apparently with some feeling, the cause of Duret against “a German doctor, Heubner.” Duret and Heubner, unacquainted with each other, pursued their researches simultaneously, and in the most essential points arrived at identical results. Let us now quote from our author :—

“In a recent work treating of syphilitic alterations in the cerebral arteries, Heubner professes to have been the initiator. That is a claim which cannot be

sustained. The first researches of Duret relative to the circulation in the bulb and the protuberance were communicated to the Société de Biologie in the session of December 7, 1872.

"By a remarkable coincidence, the same day, the 7th of December, the *résumé* of the researches of Heubner upon cerebral circulation was published at Berlin in the *Centralblatt*. One month after, in January, 1873, Duret published a note in the *Progrès Médical* concerning that part of his researches which treated also of the cerebral circulation. The investigations of Duret are not, then, two years later than those of Heubner, as the latter insinuates; they are exactly contemporaneous. Of this fact Heubner might easily have convinced himself, as he has become acquainted with the last *Mémoire* of Duret, published in the *Archives de Physiologie* (1874), where the history of the question is given in detail.

"I have thought it well to insist upon this chronology," says Charcot with genuine Gallic spirit, "in face of the annexation mania, in order to establish the large part which belongs to our countryman."

In the exposition of the cerebral circulation, the question of the amount of communication between the different vascular regions of the brain is vitally important. Do anastomoses take place between the middle cerebral and the posterior cerebral distribution, between the anterior cerebral and middle cerebral, between the anterior and posterior, etc.? If these territories communicate, in what manner? To use the language of Charcot, "Are these communications easy and constant, or, on the contrary, are they accidental, indirect, and often impracticable?" The bearing of this problem upon the prognosis of cerebral thrombosis and embolism will at once be recognized. It is a question of life or death as regards the areas supplied by occluded vessels.

According to Duret, the main vascular territories of the brain are, in great measure, independent and isolated; communications between them are difficult or impossible. Heubner, on the other hand, believes that these are very easy, that they are made by the mediation of vessels not less than a millimetre in diameter. According to Duret, what anastomotic circulation is present takes place chiefly or exclusively through the capillaries. Charcot coincides with the conclusions of Duret, believing that they are more in conformity with pathological facts than those of Heubner. Cohnheim also agrees with Duret. He holds that the arteries of the encephalon, if not *final* or *terminal*, very nearly approach that type. By *terminal* or *final* arteries are meant those arteries or arterioles which, between their origin and their capillaries, neither furnish nor receive any anastomosing branch. The ramifications in the pia mater, the nutrient arteries of the cortex, and the vessels of the central ganglia, are believed to belong to this class.

Our own clinico-pathological observations are in the main strongly corroborative of the views of Duret, Cohnheim, and Charcot, however pleasant it might be to coincide with Heubner, whose opinions would enable us to give more roseate prognoses and to infuse more hope into our therapeutics. In exceptional cases, however, more or less easy communication takes place between arterial provinces usually isolated, which accounts for the pathological cases cited by Heubner, in which obliteration of one of the vessels of the cortical system or of its branches has, during life, given no evident symptom, and in which such obliteration causes no softening. At a recent autopsy, we saw a striking case of this kind. The artery of the ascending parietal convolution was completely obliterated in its middle third, and yet no softening of the convolutions beyond could be discovered on the closest examination. The patient had been a right hemi-

plegic, this condition being probably accounted for by an old cyst in, and extensive softening of, the left corpus striatum. In such a case, either collateral circulation must have been somewhere established, or the occlusion of the vessel, although probably for a long time partial, was not complete until just before death, and hence sufficient time had not elapsed for discoverable softening to occur. This latter mode of explanation of some of the apparently exceptional cases seems to us not at all unreasonable. The condition of the blood, and the rate of its flow, about the time of dissolution, might favour those final deposits on the diseased inner walls of vessels which would cause their complete closure.

The fact to which Duret has directed attention, of the frequent variations and anomalies of the circle of Willis and the communicants, is of practical value, and is one which we have often observed. If we do not bear it in mind, we may be led to false conclusions in cases of softening, hemorrhage, etc., in regard to the manner and method of communication between the different vascular territories of the brain. In searching for the arterial cause of necrosis, it must always be remembered that the communicants, as Duret informs us, are often filiform and entirely insufficient to re-establish circulation in case of obliteration. According to him, also, certain forms of anomalies explain cases of softening of an *entire* hemisphere, by a clot obliterating the internal carotid near its bifurcation. This softening of an *entire* hemisphere we must beg leave to doubt, although a large portion of a hemisphere may in this way be destroyed.

The very nature of the circulation in the brain, so well discussed in these lectures of Charcot, might, perhaps, be looked upon as an argument in favour of localization. The brain more than almost any other organ has specific regional supplies of blood; and, in accordance with the principle of the adaptation of parts to purposes, we might expect these districts which are furnished with special and peculiar vessels, to have functions specific and peculiar.

Intra-encephalic hemorrhage claims from Charcot the attention which it deserves. We will glance at only a few of the points. He divides the external striated arteries into an anterior and a posterior group. One of the anterior arteries is especially important, because of its size and its predominant rôle in intra-encephalic hemorrhage, and could, he says, be appropriately called the *artery of cerebral hemorrhage*. The method of studying this and all other vessels is minutely given. His observations on regional diagnosis, with reference to vascular supply, intra-encephalic hemorrhage, and occlusion of vessels, throw a flood of light upon a subject which is shadowy to most professional minds.

In the tenth lecture a fine comparison is drawn between hysterical hemianæsthesia and amblyopia which are due to cerebral lesion. His standpoint, which differs from that of many other observers, is laid down in the proposition that *cerebral lesions of the hemispheres which produce hemianæsthesia produce also crossed amblyopia, and not lateral hemiopia*. Charcot's hypothesis of double decussation of the optic fibres, now generally known, is here presented. A curious historical fact is mentioned in this chapter. It is, that the hypothesis of the semi-decussation of the optic nerves, usually attributed to Wollaston, is really due to Newton, who expressed it in 1704, in his *Treatise upon Optics*, and which Vater, in 1723, employed to explain three cases of hemiopia which had fallen under his observation.

Charcot's remarks on the analogies and differences between lateral sclerosis from cerebral cause and primitive fasciculated sclerosis of the

lateral fasciculi of the cord, are as suggestive as they are interesting. Most of the points indicated are now well known to the profession; but an important matter, often overlooked, is the fact that the consecutive sclerosis resulting from cerebral lesion acquires, after a given time, a sort of independent or automatic existence.

We lay down this well-translated volume, impressed anew with the genius of Charcot.

The work of Ferrier, which is made up of the Gulstonian lectures of the Royal College of Physicians for 1878, revised and supplemented by numerous additional facts and illustrations, contains some of the matter to be found in *Functions of the Brain*; but this is not to be deprecated, as it has been re-presented not for "padding," but for clearness and fulness of exposition. In Lecture I., after an argumentative and historical statement of the question of localization, lesions of the frontal lobes receive brief attention; in Lecture II. and the first part of Lecture III. lesions destructive and irritative of the motor zone are ably and fully set forth; and in the remainder of Lecture III. the areas for common sensation and the special senses are discussed.

Ferrier's exact position is not always understood, particularly by those by whom he is criticized. In regard to motor phenomena, he believes that the cerebral convolutions surrounding the fissure of Rolando contains psycho-motor centres, or centres for movements which involve conscious discrimination, which are volitional in the strict sense of the term. They are not purely "motor" centres, that is, centres for all movements of all kinds. "Those which are variously described as automatic, instinctive, or responsive, including all the motor adjustments concerned in equilibration, locomotor co-ordination, and instinctive emotional expression, are more or less completely and independently organized in the centres situated below the cortex."

He holds to the probable existence in the præ-frontal lobes of psychical centres. He advocates sensory localization, locating the sensory centres in the parieto-temporal region, situated between the motor-area and the occipital lobes, and including the supra-marginal lobule and angular gyrus or inferior parietal lobe, the convolutions of the temporo-sphenoidal lobe on its external and interior aspect, viz., the superior, middle, and inferior temporo-sphenoidal convolutions, the occipital temporal convolutions (lingual lobule, fusiform lobule), the uncinate gyrus, and hippocampus major or cornu Ammonis. In regard to the occipital lobes, his hypothesis is that they are specially related to the visceral or organic sensibilities.

His views also in regard to the functions of the great basal ganglia—the corpora striata and optic thalami—can be briefly stated. From the cortical centres fibres pass down to the cerebral peduncles; broadly speaking, these ganglia are so placed in connection with these conducting bundles as to have the position, anatomically and physiologically, of bodies intermediate between the centres of the cortex and the parts below the hemispheres. Volitional movements originate in the gray superficial layers of the brain; these movements are more or less distinct and dissociated according to the centres in action. They may become automatic or organized.

"Movements," says Ferrier, "at first requiring true volitional effort—by which is meant action conditioned by consciously discriminated impressions present or revived—tend to become automatic by repetition, and the less varied and complex the movements, the more speedily does this automatic organization become established. It is evident from the facts of experiment on dogs that the

corpora striata are the centres in which this organization occurs. They form, as it were, the centres of automatic or sub-voluntary integration of the various voluntary-motor centres differentiated in the hemispheres." (*Functions of the Brain*, p. 252.)

The basal ganglia do not initiate either motor or sensory impressions, but they serve to receive and organize, to co-ordinate and harmonize, impressions originating in the scattered centres of the cerebral periphery. They are largely concerned with actions which have become habitual and automatic.

By far the strongest part of Ferrier's work is that which is concerned with motor phenomena. This is, of course, the phase of the general subject of cerebral localization, which, for many reasons, has been best worked out. These phenomena are objective; paralysis and spasm can be seen as well as experienced; the motor convolutions are easily reached by the physiologist, and are often the victims of disease.

The weak part is that which treats of lesions of sensory regions. Illustrative cases are far less numerous and convincing than those which speak for the motor areas. Some of the reasons for this are plain. Sensory phenomena are subjective; they are less readily determined by the physiologist, and are more apt to be overlooked by the physician. We fully agree with Ferrier, who, in speaking of the want of attention to certain sensory manifestations, asserts that the "latency has been in observation rather than in symptoms." Again and again, both in ward and in outdoor hospital service, we have seen most important sensory affections passed by, sometimes temporarily, sometimes altogether. The average clinical investigator does not always possess the time, tact, and patience required for such work.

The ground taken in regard to the antero-frontal lobes, of the existence in them of psychical and inhibitory centres, is well sustained by cases and arguments, old and new. In the *Medical Times* for January 18, 1879, we published a case of frontal tumour, which, we think, favours the views of Ferrier, although it has been urged against it that, being a case of tumour, deductions in reference to localizations are not trustworthy. We believe, however, that careful analytical study will sometimes enable us to separate the general from the special phenomena of tumour cases.

The review of Rendu—himself a contributor to the facts as well as to the literature of cerebral localization—is a comprehensive and logical presentation of the subject. His standpoint can be judged from the following statement of this object:—

"We shall try, in this review, to show that the different suppositions by which it is sought to replace the theory of Ferrier, are much less plausible than his view, and that they do not rest on anything more certain. We see that the light is still far from being perfect regarding the intimate mechanism of the cerebral functions, and the calling into play of encephalic manifestations; nevertheless, the theory of cortical centres is the most acceptable; assuredly, it is that which is least in disaccord with clinical phenomena."

He discusses the subject in its physiological, pathological, and clinical aspect. Under the head of Physiology, he gives at length the views of Ferrier, and also those of his opponents—Brown-Séquard, Lussana and Lemoigne, Vulpian, Dupuy, and others.

First in importance are the very positive opinions of Brown-Séquard, according to whom the brain is composed of innumerable reflex centres, which are put into action by a multitude of different influences; intrinsic and extrinsic. His chief conclusions, now so well known, are that a lesion

limited to one-half of the brain, can produce symptoms on either side of the body; that a small lesion, whatever its seat, can produce the most extensive and violent symptoms; that a lesion on both sides of the median line of the brain can produce symptoms only on one side of the body; that sudden symptoms can proceed from a slowly progressive lesion, and *vice versa*; that the most diverse symptoms can proceed from an invariable lesion, and, reciprocally, lesions of diverse seat can give rise to the same symptoms; that permanent lesions can produce periodical or transient symptoms; that some cerebral symptoms have their origin in an irritation of the viscera or peripheral nerves; and that, finally, enormous lesions can exist in all parts of the brain without determining any symptoms.

These contradictory facts, according to Brown-Séquard, show that nerve cells possessed of definite functions, instead of being united in a certain cerebral territory, are dispersed throughout the encephalic mass, and are joined in some way one to the other, so as to form a functional solidarity. Each cerebral hemisphere, he believes, is a complete brain, sufficient of itself for the control of both sides of the body, but most individuals do not develop equally their two brains. The clinical conclusion to be drawn from such a view is that all symptomatic manifestations of cerebral origin arise exclusively from an irritation which acts, either by arresting the activity of the encephalon, or by exaggerating it. To the first category of symptoms belong, for instance, paralysis, aphasia, anæsthesia, amaurosis, etc.; to the second, delirium, convulsions, contracture, tremor, etc.

Rendu remarks very forcibly that in order to deny the results obtained by Ferrier from physiological experiments, it is necessary that conditions shall be identical. Brown-Séquard's experiments were performed on dogs, rabbits, and cobayes, and every one admits that hemiplegia in these animals, after destruction of a hemisphere, is far from being regular. In regard to his pathological data, he shows that Brown-Séquard has accumulated systematically all the facts and supposed facts unfavourable to the idea of a localized affection. Many of these have little or no value. Only a few are well established and irreproachable. Rendu asks, with reason also: Can a hundred observations suffice to render valueless daily clinical experience, and the thousands of cases which come to the notice of all physicians engaged in hospital practice?

The researches of Pierret and Flechsig, dwelt upon by Ferrier, but, strange to say, not alluded to in Rendu's able review, undoubtedly afford to the advocates of localization one of the most satisfactory explanations of Brown-Séquard's much flaunted exceptional cases of direct paralysis, that is, of paralysis occurring on the same side of the body as the lesion in the cerebral hemisphere. Flechsig has shown by embryological research that the decussation of the anterior pyramids at the junction of the spinal cord and medulla oblongata, instead of being regular, is very variable. His investigations were made upon the spinal cords and brains of sixty fœtuses. According to him the pyramids are adjuncts to the fundamental spinal tracts, and are developed later, their development coinciding with that of the hemispheres. They are absent in cases of non-development of the hemisphere. They can be traced above to the cortical regions and below to the postero-lateral, and partly to the anterior columns of the cord. As a rule, the fibres which decussate descend in the postero-lateral columns, and those which pass down directly into the cord do so in the anterior columns. Usually, in Flechsig's research, the crossed bundles predominated over the direct. Variations were very numerous; occasionally the direct fasciculi exceeded the crossed. In one case all the pyramidal fibres



crossed the median line to the lateral columns, in another only ten per cent. crossed over, ninety per cent. descending directly in the anterior columns. Flechsig believes it possible for the decussation of the pyramids to entirely fail.

Pierret (*Bull. Soc. de Biologie*, Jan. 8, 1876, *Le Progrès Méd.*, Jan. 22, 1876) describes the case of a child in which almost the whole of the pyramidal strands were contained in the anterior columns as far as the middle dorsal region. In this case, in consequence of the almost complete absence of decussation, M. Pierret remarked that, had paralysis occurred as the result of a cerebral hemorrhage it would have shown itself in the arm of the same side, while the opposite leg would have been but slightly affected.

How much more satisfactory are explanations based upon these anatomical facts than the inverted reasoning and special pleading of Brown-Séquard? These variously decussating pyramids being the paths for the transmission of voluntary impulses, paralysis on the same side of the body as a brain lesion is possible, and does not constitute an unanswerable argument against the first and oldest fact in cerebral localization, that of the cross action of the cerebrum. In a word, the classical idea of hemiplegia has not been successfully assailed.

MM. Lussana and Lemoine hold that the white substance possesses the properties attributed by the advocates of localization to the gray. They say first that the cerebral cortex does not contain motor centres, and that its lesions do not produce paralysis; and secondly, that the peduncular system contains the true centres of motor innervation; that a lesion of this system always causes paralysis; if, sometimes, paralysis follows from a surface lesion, this depends always on indirect compression or on counter-pressure on the peduncular system. They completely deny the psychomotor centres of Ferrier. They base their views first on the fact that the cortex responds only to electrical and not to mechanical or chemical stimuli, the peduncular fasciculi responding to all. This argument, Rendu shows, really proves nothing against the existence of psycho-motor centres. It simply appears that the gray substance does not comport itself in the same fashion as the white under diverse excitations, but this is the only legitimate conclusion that can be drawn. A second reason for neglecting the centres of Ferrier is the transient and incomplete character of the paralysis or paresis following lesions of the cerebral cortex. This objection, however, says Rendu, is more specious than real, if we reflect on the modifications of structure which the brain undergoes in the various degrees of the vertebral scale; if we especially think of the antagonism which Ferrier has shown to exist between the centres of voluntary innervation and the automatic motor centres. By admitting with most physiologists that the cerebral peduncles are only conducting bundles, emanating from this double series of centres, it is clear that their section would be followed by complete paralysis; but we cannot conclude from this that the peduncles are true motor centres.

We might say just here, as probably the most appropriate place, that the objection to cerebral localization and its physiological proofs, which has been so often advanced, namely, that it is impossible to localize the action of electric currents is far from having the weight which many suppose it to possess. Ferrier states this point well—

“On the conduction theory it would be natural to expect that the nearer we go to the underlying ganglia and tracks, the more readily the effects should be called forth if it were a question of mere resistance of currents. But we find

that electrization of the island of Reil, which is nearest the basal ganglia, is absolutely negative; while electrization of the more distant postero-parietal lobule by the same stimulus produces an immediate and definite movement. Conduction would seem to be put out of court by such facts. And we find, as Carville and Duret have shown, that the intervention of a fluid cyst between the cortex and the basal ganglia is quite sufficient to interpose a fatal obstacle to the preparation of functional stimulation, though not of electrical currents, just as a ligature round a nerve will stop neurility but not electricity."

Vulpian has adopted an opinion intermediate between that of Ferrier and Brown-Séquard. Establishing himself on the inexcitability of the gray substance in general, he concludes that all parts of the encephalon possess the same physiological properties. He has, however, repeated the experiments of Hitzig and Ferrier, and has recognized the existence of regions excitable by electricity, and giving rise to determinate movements. It is, therefore, rational to admit that to these regions come fibres exclusively motor, in intimate relation, on the one hand with the cerebral cortex, and on the other with the corpus striatum. The integrity of the gray substance is necessary to that of the nervous elements of the white substance which joins it. Irritation of deep-lying parts excites the superficial convulsions.

Dupuy has sought to prove that the contractions obtained by stimulating certain convolutions are only reflex phenomena, that they are due to irritation of the nerves of the pia mater and of the vessels. He founds his opinion upon such experiments as the following: He exposed the left hemisphere of a dog at the level of the fissure of Rolando, and faradized the adjacent convolutions, producing manifest movements of the right side. This done, with a white-hot cautery, he touched the motor centres still covered by the pia mater, and then again applied electricity to the parts cauterized, obtaining the same movements. The animal presented no paralysis save a little ptosis. At the end of four weeks it was absolutely cured, without any affection of motility or sensibility. Dupuy now reopened the wound and established the presence of a dried eschar adhering to the meninges. Electrical excitation of the eschar and of the subjacent fibres now provoked no movement, while the current applied around the eschar caused muscular contractions. Dupuy's conclusion, according to Rendu, is by no means unassailable. In the first experiment, irritation of the cauterized region induced movements, because the subjacent fibres were sound; later, these being destroyed, all transmission of peripheral excitation to central parts disappeared. Thus interpreted, the experiment rather supports the theory of cortical motor centres, but with the restriction of Vulpian, a restriction which Rendu is inclined to accept.

The re-establishment of motor functions after the destruction of cortical centres is discussed by Rendu. He recalls the opinion of Broadbent, that in such cases the opposite hemisphere at once effects a work of compensation; but in opposition to this, he also refers to the remarkable experiment of Carville and Duret, who cured a temporary paralysis consequent upon an operation upon one cerebral hemisphere by extirpating the cortical centres of the other side. He believes Ferrier's explanation of these phenomena to be the most plausible. Supporting himself on his physiological views of the respective rôles played by the cortical centres and the basal ganglia, he holds that the latter, especially the corpora striata, are so organized as to act when the functions of the convolutions are in default; automatism taking the place, in such cases, of voluntary impulses. Thus can be explained the numerous differences which are seen in different

species of animals after ablation of the encephalic cortical centres. A monkey, after this operation, becomes and remains hemiplegic; a dog is only transiently paralyzed, a pigeon is not paralyzed at all—and so on for different animals, according to the degree of their volitional and automatic organizations.

A large number of facts, pathological and clinical, have been collected, and are presented by Ferrier and Rendu; a few are given in the lectures of Charcot. These are particularly full and convincing in regard to destructive lesions of the motor areas. Case after case is given to show that paralysis of the muscles of the face, arm, or leg, may be the result of circumscribed lesions of the motor zone. It will not be necessary, except in special instances, to recall these cases. They have been quoted everywhere in current medical literature. The facts in regard to brachial and facial monoplegia are overwhelming; and brachio-crural monoplegia is a condition well made out. It may be, in reference to crural monoplegia, that we are simply in need of more numerous and accurate observations. The long-established doctrine of aphasia is re-emphasized by Ferrier with striking illustrations. One point made by him is worthy of special notice:—

“To overturn,” he says, “the localization of a speech centre, it is not enough to bring forward a case of lesion of the left speech-centre without aphasia. This is admitted by all, and it is a very significant fact, that in several at least of the cases of aphasia with disease of the right speech-centre, the patients have been left-handed. It is incumbent upon the opponents of the doctrine of localization to bring forward a case in which, with bilateral lesion of this centre, no aphasia occurred. But, I need scarcely say, no such evidence exists.”

The atrophy which occurs in certain cerebral regions because of the prolonged functional inertia which results from amputation or other cause; the secondary degenerations which follow lesions of the motor zones; the negative, but not unimportant argument, of the existence of latent cortical zones—these facts present other lines of reasoning well worked out by Ferrier and Rendu, but to these we have already referred.

The facts in regard to irritative lesions of the motor area strengthens at every point the position of the localizationists. In this field the labors of Hughlings-Jackson are pre-eminent. A knowledge of “Jacksonian epilepsy” is one of the recent signal acquisitions of neurology. The pathology and symptomatology of irritative motor lesions point unerringly to the existence of cortical centres. It should never be forgotten that to Hughlings-Jackson belongs the great credit of having first indicated the motor functions of certain cortical regions, having been led up to this by observation of the phenomena of unilateral cerebral convulsions.

We are somewhat surprised that our author and the reviewer have not made more use of the numerous investigations into the symptomatology and pathology of dementia paralytica—of the researches of Meynert, Hitzig, Huguenin, and others. These are in the main confirmatory of the doctrine of localization. Ferrier contents himself with a mere allusion to the observations of Dr. Crichton-Browne on General Paralysis of the Insane.

We may, perhaps, be permitted to refer, at this point, to some cases of our own. This will be the more allowable because the observations were published too late to receive the attention of Ferrier and Rendu. In these cases (*Philadelphia Medical Times*, March 1, 1879) the symptoms produced by cortical lesions were, in the main, in accordance with the views of Ferrier, Charcot, and their school. They seemed to indicate, however, that the centres for leg, arm, and face are not so strictly and absolutely isolated in every human being as physiological experiment might lead us

to suppose. In one case, for instance, aphasia, partial right facial paralysis, marked paralysis of the right upper extremity, and paresis of the right lower extremity, were the results of softening confined to a small portion of the hinder part of the third frontal convolution, the lower end of the ascending frontal, the island of Reil, and a narrow segment of the adjoining temporal convolution. The major portion, but not all, of the region usually assigned to arm and hand movements, and the entire leg-centres, as usually given, escaped. In the second case paresis of the left face, arm, and leg, with left local spasmodic seizures, accompanied a lesion which distinctly involved portions of leg, arm, and face centres, and, therefore, it might be looked upon as strictly corroborative of the asserted facts in regard to localization. The third case was one of right hemiplegia with aphasia, partial hemianæsthesia, and unilateral convulsions, the lesion being softening of small outer rim of the island of Reil, a posterior segment of the third frontal convolution, the lower thirds of the ascending frontal and ascending parietal convolutions, the upper border of the first temporal convolution, the Sylvian border of the lower parietal, and the posterior portion of the upper parietal convolution. Except that the usually given leg-centres, high up in the ascending convolutions, were not involved, this case was one strongly confirmatory of Ferrier's views in regard to localization.

It might be here remarked that, on the whole, as Ferrier has noted, the centres for the movements of the leg have not been as clearly located and differentiated as those for the arm and face. The fact that in cases of paresis or paralysis of the arm or leg of cortical origin the lesion found does not occupy the *entire* area for the movements of these members does not necessarily militate against the view that these are the true centres for the limbs. In many instances the effects of a lesion doubtless extend beyond its strict limits. We have also thought that a sort of physiological coalescing or interaction of centres might sometimes take place. The movement of the leg and arm of one side being so constantly associated the centres for one may, to a certain extent, become capable of governing both. This, at least, is a view worth considering. Another point to be borne in mind is that, while the arm often acts independently of the leg, the latter is far less independent of the former in its movements. We write, strike, lift, and perform numerous acts with the upper extremity alone; but in walking, running, etc., the arms, as well as the legs, have parts of their own to perform. This may help to account for the fact that brachial and brachio-crural monoplegia are of much more frequent occurrence than pure crural monoplegia.

Our cases of lesion of the frontal lobes, of the basal ganglia, and of other encephalic regions besides the motor zones, also, on the whole, tend to the support of the doctrine of cerebral localization. Some of these are given in the article just quoted from; others have been presented, in connection with specimens, to the Philadelphia Pathological Society during the last and the present year, and have also been published in the Proceedings of this Society in the *Medical Times*; still other cases of both cortical and other lesions remain as yet unpublished. In short, out of more than a score of cerebral autopsies, made upon cases studied during life, we have only had two that seemed decidedly to conflict with the localization theories. One of these was a case of tumour of the brain (*ibid.*, March 29, 1879), which was situated in front of the optic chiasm, and the symptoms were chiefly those of marked left hemiplegia. The other was a case observed within a week of the time of writing, and it will hereafter be published

in detail. Softening of the pons, occupying both sides of the median line, was found, the patient several weeks before death having become paralyzed on the right of the body, the paralysis spreading just before death to the other side. Both of these cases, however, *can* be explained in conformity with the principles of localization. Tumours, owing to the general irritation which they often exert, and to the pressure-effects which result from them, sometimes give rise to symptoms which are apparently, but not really, in opposition to the view of the specific localization of functions.

Notwithstanding the immense additions which have been made to our knowledge of the physiology and pathology of the brain, especially with reference to the localizations of functions and lesions, the diagnosis of cortical paralysis from paralysis due to destruction of the corpus striatum or internal capsule, is not always easily made during life. This is pointed out by Ferrier in regard to hemiplegia depending on general destruction of the motor area of the cortex, and hemiplegia due to destructive lesions of the corpus striatum, more particularly those involving the anterior two-thirds of the internal capsule.

"There is the same relative affection of the different movements; those being most paralyzed which are most volitional, at least after the first rude shock of the disease has subsided. The facial paralysis is seen especially in the lower facial regions or in those movements which are most independent, while the frontal and the orbicular muscles of the eye are but slightly affected. The movements of the leg are less paralyzed than those of the arm, and the proximal movements of the arm less than those of the hand. Sensation is not affected if the lesion be strictly limited to the cortex or to the anterior two-thirds of the capsule; and in neither case is the nutrition or the electric contractility of the paralyzed muscles directly impaired. The same tendency exists to the development, sooner or later, of descending sclerosis of the motor tracts of the crus, pons, medulla, and spinal cord, and the appearance of late rigidity or contracture of the paralyzed limbs."

While all this is true, in a general sense, as Ferrier states, yet we are convinced that a very careful study of the two classes of hemiplegics will reveal points of dissimilarity which will largely help to a regional differential diagnosis. Fortunately, too, as Ferrier states, hemiplegia, complete from the first, and permanent, is not the most common type of paralysis depending on lesion of the cortex or subjacent medullary fibres.

"More frequently paralysis of cortical origin is fractional or dissociated, or is a succession of dissociated paralyses or monoplegiæ. In cortical affections we frequently find a hemiplegia, at first complete, resolving itself into a monoplegia, or a monoplegia becoming a hemiplegia by progressive advance of the disease to other motor centres. This latter is a significant indication of cortical disease. Paralysis of voluntary motion of the arm or leg, of the arm and face, or this combined with aphasia, if the lesion be in the left hemisphere, or paralysis of the inferior facial region, of the arm alone, or of certain movements of the hand and arm, or of the leg alone, without affection of sensation, and without qualitative or quantitative changes in electrical contractility, or direct impairment of nutrition, may be looked upon as depending on lesions of the cortex or subjacent medullary fibres"

Other points in diagnosis given by Ferrier are, the association with monoplegia, of monospasm and early rigidity, and convulsions sometimes in the limbs not paralyzed; the frequent erratic and transitory character of cortical paralysis; the fact that consciousness is less frequently lost in cases of sudden cortical lesion than when similar disease occurs in the central ganglia; the fact, noticed by Callender and others, that cortical

lesions are more frequently accompanied by localized pain in the head, and that observed by Ferrier himself, that even when pain is not spontaneously complained of, it may be brought out by percussion over the seat of lesion.

Ferrier closes his remarks on the diagnosis of cortical paralysis by the following condensed statement:—

“While we cannot be quite certain of the position or extent of a cortical lesion causing a sudden and complete hemiplegia, we may take a monoplegia of the leg or of the arm and leg as an indication of lesion of the upper extremity of the ascending convolutions close to the longitudinal fissure; brachial monoplegia as a sign of lesion of the upper part of the ascending frontal convolution, or, if the paralysis affect the hand more particularly, of the ascending parietal convolution; brachio-facial monoplegia as indicating lesion of the mid-fronto-parietal region; while facial and lingual monoplegia, or this combined with aphasia, indicate lesion of the lower part of the ascending frontal convolution, where the third frontal unites with it.”

In discussing the question of the exact topographical diagnosis in cases of cerebral lesion, we cannot afford to overlook thermometry, general and local, and in local thermometry, the results obtained by taking head temperatures, and the temperatures of various local areas scattered over the body. Ferrier summarizes a few points. Although there is some difference of opinion, it is generally stated that there is less difference in temperature between the two sides when the paralysis depends on cortical than on central disease, and subsides more rapidly. Eulenburg and Landois, and Hitzig, hold that vaso-motor paralysis occurs in dogs, in consequence of destruction of the cortical motor centres. Vulpian and Küssner contest these facts. Ferrier believes the discrepancies to be more apparent than real, and that the same law holds good in reference to vaso-motor paralysis, which is observable in reference to the degree of motor paralysis following cortical lesions in different animals, and in respect to different movements in the same animals.

Broca, in 1877, published some observations on the temperature of the surface of the head in health and in disease, the observation indicating the possibility of determining local intra-cranial temperatures by applying thermometers externally. Lombard and others have experimented in a similar way with the thermo-electric pile. In the *New York Medical Journal* for August, 1878, Dr. Landon Carter Gray, of Brooklyn, has an article on *Cerebral Thermometry*, read before the American Neurological Association, June 20, 1878. In this paper he gives the results of observations upon 102 males, taking the temperatures of various regions of the head, left and right, frontal, parietal, occipital, etc. Among other things he found the average temperature of the left side of the head to be nearly a degree higher than that of the right; and the average temperature of the frontal and parietal regions to be nearly two degrees higher than that of the occipital. He refers to a case of tumour of the brain, occurring in the practice of Dr. Frank W. Rockwell, of Brooklyn, in which the diagnosis of the locality of the intra-cranial morbid growth was made with a thermometer, and afterwards verified by a *post-mortem* examination. Rendu, referring to the researches of Gray, says, that he believes that they do not prove anything except the existence of certain peripheral vaso-motor centres; that they do not demonstrate that the temperature of the head, in the various zones examined, corresponds to that of the brain; that perhaps they are simply explained by the richness and the greater or less superficiality of the arterial supply to the different regions of the scalp.

We are strongly inclined, from some experience in cerebral thermometry, to think that the criticisms of Rendu are not tenable, and that therefore the observations of Broca and Gray are of value as directing us to new aids in making regional diagnoses. In a case of brain tumour reported to the Pathological Society of Philadelphia (*Philadelphia Medical Times*, Jan. 18, 1879), we give a series of observations made with surface thermometers upon the head, which seems to show that we can attribute a positive value to local cerebral thermometry. The temperature of the surface near the seat of the growth was higher than that of other regions. We also have made a series of observations on another case of cerebral tumour, and numerous investigations in local and general thermometry in cases of hemiplegia, monoplegia, etc., all of which tend to show the value of such observations for the purposes of localization.

The study of localization has more than one hopeful therapeutical aspect. The supplementing of action by different parts of the encephalon is one of the sanguine prospects. This supplementation, as has been pointed out by Charcot and others, may take place between motor centres and ganglia, between various ganglia, and even between various parts of the same ganglion.

Duret's magnificent studies upon cerebral traumatism constitute a portion of the practical outflow from this new epoch of brain investigation. His theory of cerebro-spinal shock is of itself a discovery of sufficient importance to justify all the labours of all the localizationists. This same author and worker in the field of localization has given us new points of value in the diagnosis of diseases of the cerebral membranes.

In a review of this kind, we would fall short of justice to our subject, if we failed to refer to the direct surgical applications of the principles of localization. Although the instances in which the surgeon has been aided by the facts of localization are few in number and often quoted, they are none the less important and suggestive. Broca succeeded in locating an abscess in the third frontal convolution. Trephining has been performed in one case by Proust and Terillon, and in another by Lucas Championnière, the places for operating having been selected from a study of the symptoms of cortical lesions presented by the patient. The possibility of operating successfully in cases of cerebral abscess the position of which might be determined by a study, in the light of localization, of the phenomena of spasm, paralysis, or sensory disorder exhibited, has been proved by several reported cases. Huguenin mentions a case of this kind. Dupuytren operated successfully on one case of abscess of the hemispheres, and other similar cases are to be found in surgical treatises and memoirs.

In conclusion, we would simply say, that we are bound by the weight of evidence from every hand to give our unqualified assent to the doctrine which is embraced in the terse proposition of Charcot:—

“The encephalon does not represent an homogeneous organ, a unit, but rather an association, or a confederation, composed of a certain number of diverse organs. To each of these organs belong distinct physiological properties, functions, and faculties. Now the physiological properties of each one of these parts being known, it becomes possible to deduce therefrom the conditions of a pathological state; this being of course but a greater or less modification of the normal state, and not the result of the intervention of new laws.”

In our opinion, “la belle doctrine” of cerebral localization is founded upon facts and principles which have not been, and probably cannot be, successfully gainsaid. It has withstood sneers and scepticism, and each day grows in favour as it grows in strength.

C. K. M.

## ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXI.—*The National Dispensatory. Containing the Natural History, Chemistry, Pharmacy, Actions and Uses of Medicines, including those recognized in the Pharmacopœias of the United States and Great Britain.* By ALFRED STILLÉ, M.D., LL.D., Professor of Theory and Practice of Medicine in the University of Pennsylvania, and JOHN M. MAISCH, Ph.D., Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy. 8vo. pp. viii., 1628. Philadelphia: Henry C. Lea, 1879.

THE appearance of a "National Dispensatory" is a matter of national importance. Presuming to speak, as a Dispensatory must, with quasi-official authority, a new work of this kind must be the offspring of unquestionable parentage, else it will find few to back it in its race for life. That Professors Stillé and Maisch have earned the right to father such a child, none will gainsay, and one therefore opens the pages of this portly volume with a confidence which it is rarely safe to feel concerning a new medical book.

Familiar as we all are with our trusty "Wood and Bache," the special features of the new work are most easily pointed out by a comparison. On opening the book, the first thing we look for is, of course, to find whether, in the order of titles, we have to deal with one alphabet, or two or three; whether we can at once turn to a stated heading, or whether, as of old, we must first bethink ourselves if the drug in question be officinal or not, and, still further, whether *made* or *bought* by the dispensing apothecary. We look, then, and are glad to find that the three-alphabet relic of barbarism is done away with, and a single alphabet, according to the Latin names, adopted as the basis of arrangement of titles. The next most novel feature is the introduction of wood-cuts, and good ones, illustrating the look, gross and microscopic, of important drugs or plants. Another happy innovation is, that under the title of each article of the *Materia Medica* are enumerated *all* the medicinal preparations of the same, whether made directly from the crude drug or from some pharmaceutical derivative thereof. In chemical matters, the modern symbols are used, but the hybrid nomenclature of the last Pharmacopœia is followed, not only in the officinal naming of the drugs, but also in the current text, a necessity which it is fervently to be hoped will not now much longer endure.

In other respects the general plan of the work is analogous to that of the "Dispensatory of Wood and Bache"; the aim being to give, in relation of drugs, both officinal and non-officinal, all the facts that concern the druggist and physician. In a general way, the chemical and pharmaceutical matter is more condensed than in the older work, while the physiological and therapeutic is considerably more ample. In the latter connection there is also the new feature of a therapeutical index of formidable size. This addition may, perhaps, be sometimes a convenience, but we cannot but think that, on the whole, such indices are of questionable advantage. For there is ever present the danger that the young practitioner will—not unnaturally—construe the index into a *therapeutical abstract*, and blindly employ special remedies for special diseases, simply because the names are herein placed in mutual relation.



In a book of this kind, anything like an extended review is obviously out of the question. So that, having pointed out the special features of construction, it remains but to pass opinion on the performance. And it is a case where the jury do not need to retire before the verdict is announced. It is a solidly good book, bearing evidence of the greatest care and of the bestowal of enormous labour in the preparation of its pages. The freshness and unity of the first edition of this book are conspicuous, and, an important point in a work of this sort, a due discrimination has been held in what to allow, and what to deny, admission, of the interminable number of things possible to be said concerning drugs. The wise aim has obviously been followed of cutting out all trivial facts, or those wholly irrelevant to the needs of the druggist or physician. In this way dreary wastes of paragraphs to be waded through in the search for some vital point are avoided, and all important points stand out in bold relief. A feature that we decidedly regret, however, is the absence of references to authorities, especially noticeable in the descriptions of the physiological and therapeutic relations of drugs. Here we have *the field*, among medical topics, most noted for the *drawn battles* waged thereon, and where, therefore, a bibliography is of unusual practical value to the student. And if in a Dispensatory, which should be encyclopædic in character, such a bibliography does not appear, whither shall the puzzled seeker turn?

By the physician, the paragraphs on therapeutics will probably be those first and most eagerly consulted; in a medical journal, therefore, these need particular attention at the hands of the reviewer. The plan adopted in dealing with this topic is thus exactly described in the preface: "In treating of therapeutics, the most trustworthy results of clinical experience are concisely set forth, without discussing the grounds on which they rest. This method has proved laborious, and has often required a prolonged judicial examination to arrive at a conclusion expressed in a few lines. Its object has been to spare the reader the labour of a personal investigation, which could only be made with facilities which comparatively few possess." Such a plan has—as all must have—both its advantages and disadvantages. By its means the student is saved the usual wearisome wade through clipped items taken helter-skelter from irresponsible writers; but, on the other hand, he has to accept, willy-nilly, the judicial decision of another mind than his own. As a judge, Prof. Stillé, in his decisions, shows great care and conscientiousness in the getting and weighing of evidence, but his "personal equation," to borrow an expressive astronomical term, is characterized by an intense skepticism towards everything new—as marked as the opposite blind faith of Ringer. In most instances, these warning notes of incredulity, coming from one of Prof. Stillé's eminence, will work good in checking that eager rush for novelties, which seems as natural a tendency among physicians as with the rest of human kind. But in some cases, if one has the right to sit in judgment on a judge, the skepticism certainly seems unwarrantable. And one feels the more right to criticize, since judgments are sometimes entered where no personal trial of the drug in question has been made by the arbiter. Thus in a recent published lecture,<sup>1</sup> Prof. Stillé, speaking of the use of preparations of salicylic acid in acute rheumatism, says: "I confess that I possess no personal knowledge of their use in this disease," adding, *postea*, "I have not, thus far, been tempted to employ it." And so, without personal trial, our author, in his judicial capacity, awards the prize for the best remedy in articular rheumatism to sodic bicarbonate, as against the claims of the salicylate. More astonishing even is the daring which sums up the "medical action and uses" of *sulphate of cinchonidia* in the brief sentence, "they have not been determined by experiment or clinical observation." Do,

<sup>1</sup> Medical Record, New York, Jan. 18, 1879.

then, the labours of the British Indian Commission go for naught? And are the enormous present sales of this salt compatible with entire lack of "clinical observation"? Other instances of the same determined disbelief are the sweeping and utter condemnation of the use, as such, of cardiac depressants like aconite or American hellebore—the doubt of any efficacy of phosphorus in neuralgia—and the omission of all mention of the antiseptic use of quinia. At the same time, curiously contrasted with this turning of the cold shoulder towards the new, is an occasional clinging to ancient therapeutic notions now commonly thought to be error; as where we are told that perhaps, after all, a probably inert preparation of conium may determine the dissipation of a cancer, or the resolution of a hyperplasia of the liver.

But enough of fault-finding. No one that lives can sit as judge in therapeutics without thereby setting himself up as a mark for some one's poisoned shaft. And so, having sent off the sharpest arrow in our quiver, we will frankly confess that the rest, if shot, would probably be bewitched into boomerangs by the magic of our target, and return to bruise the hand of the sender. Prof. Stillé has worn the ermine in the therapeutic court too long to be lightly impeached, and if exceptions to his decisions be taken, where shall we look for a higher Court of Appeals?

As a whole, the "National Dispensatory" not only makes good its right to exist, but proves itself a work which no progressive physician or pharmacist will dare to be without. It is handsomely gotten up, and is remarkably free from typographical errors.

E. C.

ART. XXII.—*The Croonian Lectures on Certain Points connected with Diabetes.* Delivered at the Royal College of Physicians. By F. W. PAVY, M.D., F.R.S. 8vo. pp. viii., 126. London: J. & A. Churchill, 1878.

THE views which Dr. Pavy holds, as expressed in this his latest communication, concerning the physiological relations of the liver to the normal appropriation of sugar, and its share in the production of diabetes, differ so slightly from those with which the profession has so long been familiar, that their statement here, further than is essential to the correct appreciation of the new arguments which he has advanced in their support, may be dispensed with. He maintains that the liver, instead of being a sugar-forming, is essentially a sugar-assimilating organ. In a condition of health, he holds that the amyloid substance of the liver is never converted into sugar; but in deviations from the state of health, sugar, in more or less quantity, does reach the circulation, and, as a consequence, appears in the urine in corresponding quantity; and that when the assimilative action of the liver is properly exerted, so little sugar is allowed to pass into the general circulation, as to be insufficient for rendering the urine more appreciably saccharine than is observed in general health; but when its assimilative function is not properly exerted, ingested sugar is allowed to pass, and in proportion as it does so the urine acquires a more or less saccharine character. It is seen, then, that the constant presence of sugar in normal urine is assumed as an axiom by Dr. Pavy, as a corollary from which follows his doctrine that the difference in elimination of sugar between the diabetic and healthy individual is merely a difference of degree, the sugar in both instances representing the unconsumed residue of ingested sugar, or sugar factors. Although Dr. Pavy lays great stress on the value which this assumption possesses in the support of his views, we cannot, however, see that he has produced any fresh arguments in its support, or has

settled the differences between Kühne, Seegen, and others. For while perhaps justly questioning the results obtained by the ordinary application of Trommer's, or the fermentation test, his results of the examination of *three* specimens of healthy (?) urine simply demonstrate the superior delicacy of Brücke's lead process, while no note having been taken of the dietetic condition of the individual, or of the persistence of the sugar, we cannot accept, as demonstrated from so few and imperfect observations, the statement that sugar is invariably a normal constituent of healthy urine.

The vital point of difference between the views of Dr. Pavy and those taught by Bernard, concerning the nature of diabetes and glycogenesis, is that while Bernard maintained the idea of an ingress of sugar, on the one hand, into the general circulation from alimentation and hepatic formation, and its destruction, on the other hand, in the peripheral capillaries, and, the balance being destroyed, that diabetes is due to an increased formation of sugar, Pavy denies all sources of sugar, except that directly ingested, and holds that diabetes is due to a decreased destruction.

In support of these convictions Dr. Pavy here alludes as conclusive, to his earlier observations as to the *post-mortem* production of sugar by the liver; but his experiments are so well known, and his conclusions therefrom so generally mistrusted, from the positive experiments of Flint, Dalton, Lusk, etc., that it is not needful here to discuss them, simply alluding to the fact that the demonstration of a *post-mortem* production of sugar by the liver does not prevent the conception of the *ante-mortem* exertion of that function; and is, in fact, only in accordance with what is observed in other organs—as, for example, the conversion of zymogen into trypsin, and the *post-mortem* development of the amylolytic ferment in a pancreas, from which all that ferment existing at the moment of death had already been extracted; and the statement that the portal blood contains as much sugar as the blood of the hepatic vein, is vitiated by the omission of a ligature to the portal vein before removal of the liver; as otherwise, the portal and hepatic veins, having no valves, the blood is not prevented from regurgitating into the portal (Brunton). It is also worthy of notice that Dr. Pavy still allows the existence of “a trace” of sugar in livers placed in a position to “prevent a *post-mortem* production of sugar.”

We cannot therefore admit, with Dr. Pavy, that the glycogenic function of the liver is simply a *post-mortem* process; and even were there stronger arguments in its favour than have yet been adduced, we should hesitate in adopting the conclusion that when a substance like glucose invariably appears in an animal tissue after death, and even in tissues removed before death, with such rapidity that the interval is to be counted by seconds (*three seconds*), that substance was not there before death (Dalton).

We can, however, coincide with Dr. Pavy's criticism of Bernard's latest method of analysis. The point which Dr. Pavy makes, is that in Bernard's process (which depends upon the fact that in an organic fluid containing sugar, the sub-oxide of copper can be prevented from precipitation by the employment of a sufficient quantity of concentrated potash solution, the effect being a simple decoloration of the fluid); “the potash and the organic matter lead to the development of a reducing substance, which, without the presence of sugar, produces a decoloration of the test.” In other words, he claims that Bernard's quantitative analyses of fluids supposed to contain sugar have really been analyses of fluids which contain no sugar at all, and have been estimations of some third quantity; an assertion which seems to be substantiated by Dr. Pavy's experiment, in which, in a fluid prepared from dog's blood in which the trace of sugar that was originally present had been destroyed by boiling with caustic-

potash, and which subsequently gave no reaction with Trommer's test, when treated by Bernard's process gave the result which Bernard had stated to be characteristic of the presence of sugar. Pavy explains this result as due, not directly to the organic matter to which the suspension of the sub-oxide has been attributed, but to the ammonia of which it is a source, while the reduction of the copper is due to some unknown factor.

Bernard's later analyses of the amount of sugar in the liver at the moment of death, are also discussed, and here again, with great justness, he takes exception to Bernard's process, claiming that the insertion of 20 gms. of liver into only 60 gms. of boiling water, cannot immediately coagulate all the sugar-producing ferment which is known to exist in the liver, or in the blood as others would have it. The effect must be to temporarily reduce the temperature of the water, and so favour the condition which the experiment is designed to prevent. It is to be remarked, however, that even by Pavy's accepted method he still obtains a trace of sugar.

In studying the normal amount of sugar in healthy blood, Dr. Pavy employs his own gravimetric method of estimating the quantities of sugar, by weighing the amount of reduced copper deposited by galvanic action on a platinum cylinder. He prefers to collect the blood at the moment of death of the animal, but before it can be influenced by the *post-mortem* action of the liver, as then, the perturbing influences necessary in the operation are avoided. Consequently, if Dr. Dalton's results are due to *post-mortem* action of the liver, the blood must be collected and examined in less than three seconds. His examinations of blood conducted in this manner, revealed the presence of sugar in the proportion of from 0.787 to 0.521 per 1000 parts, in opposition to from 1 to 3 parts per 1000, as stated by Bernard; while his examination of the liver when *post-mortem* change is prevented, revealed from 0.056 to 0.597 parts per 1000, in opposition to 1 to 3 parts per 1000, as claimed by Bernard.

Deferring for a moment any comment on these results, let us examine his observation as to the destruction of sugar in the circulation.

To answer the theory of its destruction in the systemic capillaries, comparative analyses are made of the venous and arterial blood, and he states that even if there should be found more sugar in the arteries than in the veins, there need not necessarily be invoked the *destruction* in the capillaries, as the loss may have been due to mere osmosis. He also directs attention to the fallacy apt to complicate results, in which the blood was not drawn simultaneously from artery and vein, and thinks this may explain the discrepancy between his results and Bernard's. Though it seems that his method of first killing the animal, and then "drawing a scalpel across the artery and vein determined upon, without any attempt at isolation," leaves a great deal to be desired as regards precision and reliability as to the exclusive source of the blood, and that, too, in experiments which are expected to show how errors from carelessness are to be avoided. Even in these we notice a slightly higher average in favour of arterial blood—arterial .8475, venous .8347, leaving an excess for arterial blood of .013—while his experiments relating to blood drawn in life show 0.003; results which he states are so small, the excess being first on one side and then on the other, as to permit of their being attributed to deficiencies of the method.

When we notice, however, that no note is made of the nutritive condition of the animals experimented upon, the amount of glycogen in the liver or in the muscles, and when we remember that the muscles have the power of taking up sugar from the blood, and converting it into glycogen (Weiss), of forming sugar again from this glycogen, and of changing both the sugar they form and the greater part of that which they receive from the blood into lactic acid and glycerine which

undergo combustion, and when we remember that Ludwig and Genersich have *demonstrated* a reduction of sugar in blood which passes through *contracting* muscles, the observations of Dr. Pavy are not of much importance, particularly as in experiments the muscles were at rest, and it is known that muscles at rest receive comparatively little arterial blood. And then clinically it has been shown that muscular exertion will diminish the amount of sugar excreted in diabetes. (Senator.)

His conclusions, however, are that there is only a small amount of sugar in the blood, there is constantly a small amount in the urine, and any difference between the amount of sugar in arterial and venous blood is too small to be considered of any significance.

In fact, he says that no evidence of destruction of sugar in the economy has been furnished, and he holds that "corresponding with the amount of sugar in the circulation there is elimination with the urine, and therefore whatever accumulation occurs becomes revealed by the condition of urine;" and he attaches great significance to the fact that, even with the slight amount of sugar found in the blood, there is a constant escape by the urine. That the quantity of sugar in urine is an indication of the condition of the blood is further supported by a table in which their relative proportions are shown, but certainly some explanation should be given of the fact that, although he has claimed that the blood in all localities presents an equal proportion of sugar, the proportion of sugar in the urine should be more than twenty times greater than that of the blood. If this relation is as fixed and definite as Dr. Pavy claims, we would expect that the condition of the blood would also indicate the condition of the urine, as he has expressly declared "that, corresponding with the amount of sugar existing in the circulation, there is elimination with the urine;" and we would, therefore, expect that in those animals whose blood was shown to contain about 0.5 parts per 1000, their urine should have contained 10.0 parts per 1000. We doubt, however, if such was the case; and if we are mistaken then the animals were diabetic, and should not have been used in conducting investigations as to physiological conditions. The observation as to diffusion of sugar has here, of course, no force, and in fact was created to explain the fact that sugar may be introduced into the circulation without appearing in the urine.

As regards the materials which go to form glycogen, Dr. Pavy is in accord with most observers, and we also notice that he states when "sugar is voided upon a strictly animal diet, . . . such sugar may be put down as taking origin from the abnormal descent of the amyloid substance derived from nitrogenous matter." He, however, persistently declares, from the considerations above alluded to, that it never, except under unnatural condition, passes into sugar, but, he thinks, gives origin to fat, although the only evidence that can be adduced as to such transformation is that the carbo-hydrates, from most of which glycogen can be produced, lead in some way or other to the accumulation of fat in the body, "but no one has yet been able even to suggest the way in which glycogen could be converted into fat." (Foster.)

These, then, are his opinions as to the physiological relations of sugar to the organism, and he next takes up its pathological relations in the production of diabetes.

Believing it demonstrated that the quantity of sugar in the urine is directly dependent upon the quantity of sugar circulating in the blood in both health and disease (this normal minute quantity being derived from that absorbed by the thoracic duct), and that normally all the sugar and glycogen factors injected in the food become converted in the liver into amyloid substance, which in its turn never *normally* becomes sugar, but is destined to form fat, he holds that diabetes

must be due to some condition which mainly prevents the conversion of sugar into amyloid substance, and secondarily favours the transformation of the latter into sugar, although he subsequently states that he inclines to the opinion that diabetes results simply "from the simple passage of sugar through the liver." A theory, however, which is rendered untenable by the fact that Grobe has found glycogen, though in small quantities, in the liver of a diabetic; and it has been found that the excretion of sugar can be increased by the administration of glycerine, a substance which forms sugar only after having been converted into glycogen in the liver. So, too, when the sugar puncture is performed in an animal in which the formation of glycogen has been prevented by arsenic, glycosuria is not produced.

The production of diabetes, however, he believes to be dependent upon an excess of arterial blood in the portal circulation, and details in its support an experiment in which the injection of defibrinated arterial blood into the portal vein was followed by marked glycosuria, while a similar procedure with venous blood had no effect. Although this explanation seems to account satisfactorily for the production of diabetes from nervous lesions, that is, as far as the undoubted concurrence of diabetes and disturbance of the abdominal circulation, in support of which he makes the extravagant statement that the redness of the tongue in diabetes may be considered as an index of the over-arterialized condition of the portal blood, it hardly seems that such a marked perversion of glandular action could follow a mere increase in its supply of oxygenated blood—that we could have an entire suspension of its normal function and its direct contrary established. We might imagine, as would accord with the theory of glycogenesis, that an increased arterial supply might cause an increased functional activity, but hardly the conditions accepted by Dr. Pavy. But, besides, Dr. Pavy has himself brought forward facts which increase the difficulty attending the acceptance of his views, such as the ligature of the vena porta, by which, of course, an excess of arterial blood was not created, and yet there was an increase of sugar in the blood with an ingenious explanation as to why it did not appear in the urine; and then, if we are to infer from the context that in this condition the liver received arterial blood alone (hepatic artery), and hence diabetes, we would expect that section of the vaso-motor nerve accompanying these vessels, by which the arterial blood-supply would be increased, would be followed by diabetes. Dr. Pavy's earlier observations, however, have proved this not to be the case.

But then Dr. Pavy has also shown that an excess of venous blood in the liver, as in asphyxia, may be productive of diabetes. This condition of affairs, which he believes is only *apparently* inconsistent with his views as to the arterial production of diabetes, is explained by the increased pressure to which the hepatic cells are subjected by the venous engorgement causing "more or less transudation and direct admixture of their contents with the blood," and the production of diabetes in a manner analogous to that caused by the direct injection of glycogen into a *vein*. If this is the correct explanation, why does not the injection of venous blood into the portal vein, by which a local venous plethora is produced, cause diabetes?

The production of glycosuria by carbonic oxide is explained by the similarity of action on the hemoglobin possessed by this gas and oxygen.

Going back now to the physiological condition, he states that the reason the glycogen accumulates in the liver is on account of its peculiar venous supply, and offers this condition as an explanation of the development of sugar and absence of glycogen in the early months of fetal life, when the arterial supply to the liver is very great, and the venous supply comparatively insignificant, while in later months the portal circulation acquires more importance, and hence the conver-

sion of glycogen into sugar is stopped, and glycogen is then to be found in the liver. He also states that the conditions in which glycogen accumulates in other localities is in favour of his view, as in muscles at rest, in hybernation, and in solidified lungs in pneumonia. In other words, glycogen tends to accumulate in certain structures under the existence of a limited supply of oxygen; when more oxygen is supplied it is converted into sugar. It does not seem, however, that this explanation is any more satisfactory than that of Brunton, who attributes the storing of glycogen in such localities to the rapid cell growth there taking place.

Finally, we must take exception as to the manner proposed by Dr. Pavy in which lesions of the nervous system produce diabetes, viz., by causing "the presence of oxygenated blood in the portal vein." For it has been pointed out by many observers, more especially Cyon, that after such lesion it is the circulation in the hepatic artery that is modified while the portal circulation is apparently not affected, while vaso-motor paralysis of the intestine, which he considers "constitutes the key to the explanation of the saccharine condition of the urine in diabetes" when artificially produced, as by section of the splanchnic nerves, not only does not cause diabetes, but even prevents its production by the sugar puncture; the explanation of this fact by Cyon not being adequate to account for its production under Pavy's theory. Besides, it should not be forgotten that the vascular dilatation might be quite a secondary and non-essential phenomenon, as in following out the simile drawn by Dr. Pavy in the case of the salivary glands, the secretion of saliva following stimulation of the chorda is not necessarily due to the consequent vascular paralysis, as the vascular dilatation may be produced, as in atropia poisoning, by stimulation of the chorda without any secretion; and on the other hand secretion may be produced by the same stimulation, even in the absence of the circulation.

In conclusion, we can see no grounds in the arguments here adduced by Dr. Pavy for discarding the opinion that the glycogen of the liver is a reserve fund of carbo-hydrate material to be converted into sugar as the needs of the system require. While diabetes from the passage of ingested sugar unchanged through the liver, if it occur at all, is only one of many ways in which the disease may be produced (see the admirable lectures of Lauder Brunton on Pathology of Diabetes, in *Brit. Med. Journ.* 1874), we cannot consider that Dr. Pavy has proved that the normal function of glycogenesis is due to the presence of venous blood in the portal vein, and the morbid condition of diabetes is due to super-oxygenated portal blood.

R. M. S.

ART. XXIII.—*Lectures on Dermatology; delivered in the Royal College of Surgeons of England in 1876-1877-1878. Including Derangements of the Colour of the Skin; together with Affections of the Nails, Hair System, and Cutaneous Gland System.* By ERASMUS WILSON, F.R.S., etc. 8vo. pp. 286. London: J. & A. Churchill, 1878.

THE present volume concludes the nine courses of lectures delivered by Mr. Wilson on the foundation established by himself in 1869. It is possible also that it marks the conclusion of dermatological teaching from that chair, since we learn that the scope of the endowment is to be enlarged "to embrace original work in every department of surgical pathology." There is, therefore, a certain, almost pathetic, interest in these lectures, since not only is it unlikely that Mr. Wilson will hereafter publish any other work, but the lectures themselves, now concluded,

mark the close of an epoch. For years Mr. Wilson has been the acknowledged leader of British Dermatology. His works, studied by physicians in all English-speaking countries, and translated into foreign languages, have served until within the last few years as one of the chief sources of enlightenment upon the subject of which they treat. But, either the isolation in which Mr. Wilson as a specialist must for many years have lived, or a certain independence of character, fostered in its relation to his dermatological views by an immense clinical experience, has placed him in a position quite different in many respects from that occupied by his fellow dermatologists the world over. In two points particularly is this difference marked: In the nomenclature of skin diseases, and in the pathology of the parasitic affections. Mr. Wilson has added many new names to dermatology, and has frequently renamed familiar affections, and changed the names of well-known diseases, to the great perplexity of students making their first acquaintance with skin diseases through his works, or comparing them with the teachings of others. To recall an instance: some years since Mr. Wilson conceived the idea that ordinary psoriasis is the degenerate and effete progeny of leprosy. Forthwith psoriasis received the name of *lepra*, and patients suffering from this mild and comparatively curable disease have been nearly driven frantic with the idea that they were affected with elephantiasis Græcorum, or true leprosy. The present writer had at one time under his notice a woman whose life had been embittered for years through the announcement on the part of her medical attendant that she was the victim of true leprosy; the fact being that she had suffered from a scaly eruption closely resembling psoriasis—the *lepra* of Wilson.

Many years ago Mr. Wilson made up his mind that there was no such thing as a parasitic skin disease, and he “has since seen no reason to change his views,” notwithstanding that *all* other dermatologists, American, English, German, and French, unite in ascribing a fungous origin to a large class of skin affections. Mr. Wilson thus appears in the slightly absurd position of one who having once made up his mind defies mankind to move him.

These peculiar notions lead to some extraordinary statements on the part of Mr. Wilson in treating of the various diseases. Thus, under the head of “derangements of colour of the skin,” we find the affection known as tinea versicolor, which is generally maintained to be a parasitic disease, described as “essentially an affection of the follicles of the skin, accompanied with a varied amount of congestion of their capillaries, and by a disturbance of nutrition of the epithelium of the follicle and adjoining epidermis.” Under the head of tinea capitis or ring-worm, this disease is defined as “essentially an inflammation of the follicles of the hair; in a word, a folliculitis.” Favus is “marked by a phytiform degeneration of the cell-tissue of the epidermis and its cognate structure the epithelium.” While the clinical description of the favus crust is minute and extensive, no mention is made of the microscopic appearance of the crust, further than the above allusion. Again, in summing up his views upon the character of these affections, tinea, favus and versicolor, Mr. Wilson reiterates his opinion that “the phytiform structure is . . . . developed where it is found, that it is independent of any organisms existing exteriorly to the skin, and that it is incapable of transmission by contact or inoculation.” In speaking of sycosis, Mr. Wilson appears to be completely in the dark as to the diagnostic signs which separate the parasitic and the non-parasitic varieties. He does not of course admit the existence of any parasite in the disease, although he appears to be fully aware of the existence of two forms which he calls respectively mentagra and sycosis. In attempting to describe these, Mr. Wilson is not clear, and is even especially muddling in places, as indeed could hardly fail in the endeavour to prove the identity of dissimilar and distinct affections.



It has seemed necessary, in examining a work like the present, to speak of these matters in some detail because they occupy the main part of the volume. But there are other points which may be touched upon with more pleasure, and among these is the description of the various diseases of the hair. Mr. Wilson's enormous experience has stored his mind with an abundance of illustrative material which he uses with very good effect, and the sections which treat upon the subjects of "excessive hairiness," "baldness," and "grayness," are among the most instructive and agreeable in the book. Even here, however, we are constantly annoyed at the brevity and imperfection of certain interesting clinical histories personal to the author, and also by the absence of any reference to date and place in speaking of the work of others.

To the specialist Mr. Wilson's books are of advantage, but for the general practitioner or the student they are not to be recommended. We know of no surer method of bewildering and wearying the student of dermatology, and of perplexing him and leading him astray than can be afforded by a careful perusal of the brilliant series of works written by Mr. Erasmus Wilson. A. V. H.

ART. XXIV.—*Papers on the Female Perineum, etc.* By J. MATTHEWS DUNCAN, A.M., M.D., LL.D., F.R.S.E., Obstetric Physician to St. Bartholomew's Hospital. Small 8vo. pp. 156. London: J. & A. Churchill, 1879.

THIS is one of the exhaustive monographs, based upon personal observations, for which Dr. Duncan has become famous as a writer and contributor. Unwilling to regard the teachings of our fathers as necessarily correct and well established, he has, by careful investigations, upturned in several instances opinions which proved to have been founded rather upon faith than facts. In this book we find that he has been at the same kind of work, in regard to the frequency of ruptures of the perineum, vulva, and vagina in natural parturition; embodying in it several special articles that have appeared over his name during the last three years, and making of the whole a very complete treatise. The main points under investigation are the following, viz., Laceration of the vaginal orifice inevitable in primiparæ; description; cause of; Stellate and circular lacerations; Frequency of central rupture; Cracks of perineum; Vestibular lacerations; Supporting perineum and effect of forceps; Lacerations in multiparæ; Partial and complete central rupture; Laceration of recto-vaginal septum; Fistula from central rupture; Post-partum sloughing of perineum and recto-vaginal septum; Relations of fœtal head to rupture; Fœtal heads in primiparæ and multiparæ compared; Procidencia of pelvic viscera.

A few words from the first page of the work show how different have the results of Dr. Duncan's observations been, from what has so often been taught in obstetrical text-books: "The orifice of the vagina I believe to be invariably injured in the natural labour of a primipara. At least, I have never seen it otherwise. The perineum, or its anterior edge, the fourchette, or in other words, the posterior margin of the vulvar orifice, frequently escapes laceration, as the sequel will show."

Dr. Duncan believes that the orifice of the vagina is generally the undilating and resisting point, and not the perineum; and says of such cases, "I have often delivered without any injury of the perineum resulting, though certainly not without any injury of the orifice of the vagina."

"It is quite common to hear assertions of the complete absence of laceration in primiparae, but I have never been satisfied that in the cases referred to, a sufficiently careful examination has been made. To do it, one requires a good light, an assistant, and a sponge."

"The injuries that can be discovered in examining women after delivery are for the most part arranged around the vulvar opening in a stellate manner radiating from a centre. . . . Of the 89 injuries described in these reports of 25 cases, 83 were of this stellate character, or about 93 per cent."

"If a laceration is inevitable, treatment to prevent it can be of no avail. But all the lacerations of the vagina are not inevitable, and that one which is so, may be treated with a view to prevent its extension beyond the inevitable degree."

. . . . "The accoucheur can prevent the precipitate expulsion of the child, and its attendant evils." p. 17-18.

Dr. Duncan, in opposition to the teachings of Leishman, and Graily Hewitt, is very decidedly in favour of supporting the perineum, and thus securing a gradual dilatation of the endangered tissues.

The absence of pain and soreness in the woman is not to be taken as evidence of freedom from laceration. "In Case XII. the lacerations were numerous and very severe, the vulva having the appearance of being gashed in various directions, yet the woman declined to admit that she had any pain in the pudenda, and catheterism was frequently performed without any complaint being elicited."

"The injuries that can be discovered, . . . are for the most part arranged around the vulvar opening, . . . radiating from a centre," and are "like clean cuts, some more or less ragged on the edge. Others might be called deep abrasions, and have been designated ulcers." "Some were evidently the result of longitudinal or axial strain," and were "more or less circular, . . . that is, transverse to the direction of the strain." "Among the injuries described in the 25 cases, three cases, or about 12 per cent., belong to the central perineal category." "In one case, No. VI., there were 8 separate lacerations." "In several instances the vestibular and anterior lacerations were more extensive than the perineal and posterior, but the latter were generally the predominant injuries in their extent." "In 10 cases out of 25, the perineum escaped unhurt, the fourchette being entire. In only 9 cases out of 25 was the vestibule untorn."

We have given sufficient of the author's investigations to either induce the obstetrical reader to desire to possess the whole work; or to enter upon a series of personal observations by which he may satisfy his own mind as to the proportion of such injuries that occurs in his own practice. There are several questions left open by Dr. Duncan, which may be looked into, viz., Does resisting the perineal expansion, endanger vestibular rupture, or an increase over the common measure of it? Does the use of the short forceps increase the danger of vaginal laceration, and to what extent? What connection is there between the existence of vaginal cracks and abrasions, and the liability to septic infection, either from without or within? A series of parallel investigations, in assisted and unassisted cases, might be of some value in establishing the degree of utility of many obstetrical appliances believed to be for the benefit of the woman in curtailing the degree of her danger and suffering.

R. P. H.

ART. XXV.—*Health, and How to Promote it.* By RICHARD MCSHERRY, M.D., Professor of Practice of Medicine, University of Maryland; President of Baltimore Academy of Medicine, etc. 24mo. pp. xi., 185. New York: D. Appleton & Co., 1879.

THIS little book aims to do for the individual and the family what has been so well done for the public, or for large bodies of men, by several distinguished authors. It speaks to the father and the mother rather than to health officers and military authorities. It is true that its scope is, to a great extent, included in that of the more general works; but the bulk and expense of the latter, with the fact that their teachings are not wholly comprehensible by unprofessional readers, render some such book as this very desirable.

An admirable analytical Table of Contents lays out with great clearness the ground to be gone over. The work is in two parts. The first, after showing that hygiene is the better part of medicine, proceeds to show in successive chapters the especial precautions adapted to preserve health during the different age-periods of twenty years each.

The chapter dealing with health-preservation from birth to twenty years is divided into sections partly referring to subdivisions of the time, as "Infant Life," "Childhood," and "Youth;" and partly to especially important influences which bear, or may bear, upon healthful development: as the "Intellectual and Moral Training," "Kindergarten," "The School-house," and "Physical Exercise." The observations, suggestions, and criticisms, in this chapter, are very just, and clearly expressed. There is little pretension to originality; indeed, prominent writers on health and education are very freely quoted. The remarks on intellectual and moral training, on light and varied tasks for the very young, against precocity in general, and in advocacy of systematic physical culture going hand in hand with study, are particularly good. The author sympathizes with the late Dr. Clarke in his views of coëducation of the sexes; and is also emphatic in his denunciation of the stupid and murderous construction of school-rooms. Correspondence with the authorities of the Naval Academy, and of the Virginia Medical Institute, bears testimony to the beneficial effect there noticed, on the health of lads, from the systematic drill, exercise, and general attention to bodily condition, which is closely mingled with mental training.

In the chapter upon the "Young Man and Young Woman," parents are strongly counselled never to encourage any aspirations after a life of ease and idleness. Health, of mind and body, is best promoted by regular and useful activity. No work, is as bad as, or worse than, overwork. An earnest plea is made for early marriage—(*i. e.*, by the time the age of twenty-five is reached.) In order to render such possible, he justly argues that boys and girls must be brought up with more modest and rational ideas as to dress, establishment, and luxuries, than are common in our day and land.

The chapters on "The Man," and "The Woman," and upon the "Declining or Old Man," are judicious; the latter especially is full of wise counsel and suggestion, very neatly expressed. In our country, above others, it is particularly rare to find men growing old gracefully. High pressure is maintained till the machinery breaks down, and the man passes from full manhood to dementia; or, more rarely, he abandons his laborious habits while yet in health, retires from business, and painfully endeavours to "enjoy" his wealth and leisure. Whether or not an early training of a different character might cause the latter course to be a success, we will not undertake to say; but as things are here and now, it

usually proves a sad failure—the man is lost, bored, restless, discontented beyond endurance.

Part Second of this little book is entitled “Hygienics in some Detail,” and treats of the influences, habits, conditions, and surroundings which affect human health in general, and which are, to a greater or less extent, capable of control or modification by intelligent action.

Temperament, idiosyncrasy, heritage, habit, and constitution, are first viewed in their relations to hygienic effort. Professional readers scarcely need to be told the drift of this chapter. Much stress is laid upon the potency of inheritance, especially as affecting the health of children born from “intermarriage of disease”—consumptive men marrying cancerous women, etc.

In the chapter on the “Air we Breathe,” very much importance is rightly attached to the purity of the atmosphere in bed-rooms, and in gas-lighted sitting-rooms occupied by families. The “bed-room smell” must be familiar to every one. The air of sitting-rooms not only becomes close and hot, and loaded with the products of combustion in gas-burners and in lungs, but, as is palpable to the sense of smell, also with effete organic particles. These latter, as is now pretty well understood, are by far the most important element in “crowd-poisoning.” The amount of carbonic acid is very generally of comparatively little importance, save as it roughly measures the animal pollutions. We know a certain sitting-room in which, with an open fire, the air seems to a caller perfectly sweet and wholesome, but which—with the same occupants, same number of gas-jets, and all conditions identical, *except that the fire is omitted* on account of mild weather—becomes absolutely offensive from organic odours, to a visitor from the open air. The author’s remark that the disuse of “Venetian shutters” is a great mistake, we heartily agree with. While excluding, when desired, the direct rays of the sun, they allow of windows being open, and they break the draught and diffuse the entering air as no curtain or hanging shade can do. Privacy is assured, too, by the first, while the latter secures that end only when the window is closed, to prevent the wind from displacing it.

Our writer attributes “cholera infantum” to foul air, rather than to improper food; but he seems to ignore entirely the direct effect of excessive heat.

Speaking of “malaria,” in its restricted sense, as producing fever and ague, he says it may be generated by decaying vegetable matter in a cellar. We doubt whether this statement will be generally accepted as true. He accepts the theory, recently offered, that the “mountain fever” of the far West is malarious, and due to spores which, borne on the winds, are entangled in the nascent snow-flakes, and subsequently poured into the hill-side torrents.

The chapter on “Water” is well adapted to its purposes. We are glad to notice warnings against the use of excessively cold water, and in great quantities. It is really painful, while travelling by rail, to note the incessant and inordinate guzzling of ice-water by children. The consumption is obviously enormously above the requirements of a healthy thirst. We are not sure that the potency of this habit, for evil, is yet at all sufficiently appreciated. Parents should certainly discourage it, by precept and example.

Treating of clothing, we are glad to see the wearing of water-proof cloaks and shoes reprobated, except for a very short time. Of course, small waists, tight shoes, long trains, out-lying or semi-detached bonnets, come in for their well-deserved condemnation.

In his chapter on “Food,” we cannot help wishing that our author had been a little more outspoken in explaining the inferiority, for nutriment, of the “refined flours,” as compared with those which retain a large portion of the cortical substance of the wheat-grains. The proper growth of bones and of brain is too

important a matter not to be made a very prominent consideration in the choice of diet,—especially for children.

Practical hints on the principles of wholesome cookery, and directions for the choice of meats, are here not at all out of place, and may do much good. Under the heading, the “Manner of Eating,” the principles upon which deliberate eating is adjudged favourable to health are clearly stated. And another caution is well worth heeding—the amount of nutriment should be proportioned to the work or active exercise. As a rule, he says, the prosperous classes eat too much. We believe this to be especially true in this country.

Upon the alcohol question, Dr. McSherry holds common-sense views. Alcohol is a food (in certain diseased conditions, at least), a stimulant, or a narcotic, according as circumstances and doses vary. Without inquiring very closely whether alcohol is ever actually needed or beneficial to the healthy man, he believes that very moderate potations of light wines or beers may be safely taken with meals, and after labour. His limit is so much of these as shall contain, at most, two ounces of alcohol in 24 hours.

The effects of tobacco are considered in the same moderate temper. For lads and young students especially, he deems any indulgence extremely harmful, and cites, in confirmation, a report on the subject by a committee of three naval surgeons appointed to ascertain the facts as witnessed in the Naval Academy. Very many adults may safely smoke in moderation.

Having now glanced at the contents of Prof. McSherry’s book, we have a few words to say as to the manner in which its subjects are presented. There is little or no pretence of bringing forward any new light. The best ascertained principles of hygiene are set forth, very frequently, in frank quotations from eminent sanitarians, such as Richardson, Bowditch, Hufeland, and a score of others. The work might almost be termed a compilation. We do not by any means complain of this as a fault. There are, however, one or two points open to criticism; such extremely free use of Latin and French quotations, poetical and proverbial, as we find here, is surely a little objectionable in a book for popular use. A somewhat too obvious striving to be humorous, occasionally gives an appearance of flippancy to the discussion of important matters. True, it may be pleaded that some readers may be attracted by a light and airy manner. On the whole this little book seems to us very well adapted to its purpose, and will, we hope, have a wide circulation, when it cannot fail to do much good.

B. L. R.

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ART. XXVI.—*On Deafness, Giddiness, and Noises in the Head.* By EDWARD WOAKES, M.D. Lond., Surgeon to the Ear Department of, and to, the Hospital for Diseases of the Throat and Chest. Svo. pp. 143. London: H. K. Lewis, 1879.

THIS small work contains a large number of practical hints as to the physiological origin of the symptoms alluded to in the title. It is, therefore, a valuable guide in making a diagnosis in some of the most annoying cases the aurist meets, or his patients endure. It may be said that this book has as its chief object the explanation of numerous aural diseases by means of the reflex irritation conveyed to the organ of hearing from various irritated and relatively remote regions. Thus, ear complications in dentition, resulting often in fatal convulsions, are shown to be due to the irritation conveyed from the inflamed gums, through the inferior dental nerve, to the otic ganglion and thence to the nervi vasorum of the carotid plexus.

Since the latter nerves possess inhibitory power over the internal carotid artery, which sends a branch to the drum head (tympanal branch), the parts of the ear thus supplied by the carotid become gorged with blood when this inhibitory power is taken off. The effect in such a case is to "excite waves of vessel-dilatation in the correlated area." The vessels of the drum become distended; acute congestion is thus established with its attendant stretching of the sensitive and tense tissue in which it occurs, and so occasions the pain experienced by the subject of these conditions. If the irritation be sufficiently prolonged, effusion into the tissues ensues, which, under favourable circumstances, will pass on to suppuration and constitute a veritable otorrhœa. But before suppuration is fully established here, there is great danger of an extension of inflammation to the membranes of the brain. This the author shows to be due to certain structural arrangements at the petro-squamosal fissure. At this fissure, in the infant, the dura mater dips down into the tympanic cavity, becoming continuous with its muco-periosteal lining. This process of dura mater is richly endowed with vessels from the middle meningeal artery, which also supply the drum cavity. It becomes manifest, therefore, that congestion and inflammation of the drum cavity may be directly and rapidly conveyed to the meninges of the brain in infants. Towards adult life this fissure becomes more or less obliterated, though the vascular arterial connection exists. The author very justly states the obvious conclusion that "when brain symptoms develop themselves in an infant, it is to the *ear* that attention should be primarily directed."

In the treatment of such a case of ear disease from dentition, a comfortable posture should be secured for the infant. "This is best done by placing it on a large pillow across the knees of the nurse, who must be enjoined not to rock it, as every movement will aggravate the patient's suffering. The head may be raised somewhat by a small horse-hair cushion placed under it. The room should not be very light; it should be free from noise, and the temperature cool. The affected ear, which will usually correspond with that side on which the gums are most swollen, should be uppermost. It should be fed with a spoon, as the act of sucking increases the pain. Attention to these details will add greatly to the ease of the sufferer, and in proportion promote recovery." Of course the gums must be lanced, since by this operation, the waves of irritation proceeding from the gums to the ear are stopped, and the dilatation of the vessels subsides, if no trophic changes have occurred. This short sketch of the morbid processes in dentition will serve to show what the author means by reflex irritation.

Among important symptoms in an infant suffering from aural disease, is rolling of the head from side to side. This the author considers the counterpart of vertigo in later life, as in Ménière's disease, and would of course indicate that the disease had invaded the labyrinth, and, as the author believes, the semicircular canals. In older children affected with grave lesion of the internal ear, sobbing is set down as a symptom; and it is also said to occur as a constant symptom in adults affected with recognized labyrinthine disease.

In the chapter on ear diseases arising in the exanthemata in childhood, the author alludes to the necessity and importance of puncturing the drum-head. He shows, we think, that many deaths among children suffering from these diseases, and which are attributed to the "oppression of the sensorium due to the intensity of the blood-poison," are really due to lesions in the middle ear, and the extension of the morbid processes to the meninges of the brain, or to pyæmia, embolism, and thrombosis arising in the ear. The author bases his statements on an experience extending over four or five epidemics of scarlet fever, and the usual amount of measles, smallpox, etc.; and he shows that, from the commencement of an exanthem, the drum-head should be kept under observation, "just indeed as the

conjunctiva would be under similar circumstances." In many cases the application of a leech near the ear "will prevent future trouble;" in fact, may obviate the necessity for puncturing the drum-membrane.

We agree with the author in all he claims for the necessity and benefits of this operation, but we do not think well of the use of "his duck-bill-shaped instrument," which he introduces into the meatus and fastens there, to enable him to puncture the membrane. Such an instrument should not be introduced into an infant's ear, even if there seemed to be any need of it; and we may say there is no need for such an instrument in any case of paracentesis of the drum-head. It is a cumbersome instrument, and is in fact nothing more than Charrière's aural speculum, with everted lips at the smaller end. The latter feature is especially bad, since the sides of the instrument are more liable to press into the tender walls of the auditory canal, and give great pain when the speculum is opened.

The author stands alone among those considered as authorities, in his preference for the inferior quadrant in front of the malleus handle, for the position of the incision; and he is again open to criticism in the kind of knife he advises with which to puncture the membrane. Simplicity in all the instruments used about the ear is highly desirable, but this knife must be pushed by a thumb-spring, in order to use it. This would necessitate pressure against, as well as the cut into, the inflamed membrane. Furthermore, if the entire outside diameter of this instrument exceeds a millimetre, it cannot fail to darken the auditory canal when passed down it, and hence the operator would find it highly inconvenient. Some such experience may have led our author to devise his duck-bill-shaped instrument to widen the canal. But, as we have already said, this is out of the question, if the ear is to be manipulated without pain to the patient. After the perforation is made, however, by any means, we have never found it necessary to endeavour even to wash out the tympanic cavity and the mastoid cells with a solution of bicarbonate of soda, as recommended by Dr. Woakes, for two reasons: first, because with a free opening in the membrana tympani, matter will escape fast enough not to take away too much pressure from the atonic vessels in the drum; and secondly, regarding the mastoid cells in infancy, it may be said that they are so small or so meagrely developed as not to demand the attention they require in adult life.

We regret that in a book, where there is so much of value in the etiology of disease, there is so much to criticize unfavourably in the treatment of aural diseases generally. But this we suspect is due to unfamiliarity with aural works, the author having advanced to his aural studies through a predilection for the investigation of nervous phenomena generally. Were this not so, he would not claim, at least by implication, the invention of his "duck-bill-shaped instrument," nor of his "pneumatic retractor," both of which are well known to aurists as at least very old in principle and application. And at least one of the author's theories is open to the same criticism; we mean his views regarding the objective nature of tinnitus, in opposition to the usually received idea that tinnitus is a subjective state. It is doubtless due to morbid vibrations in the bloodvessels, *i. e.*, true sound-vibrations in the ear, as very graphically shown by Dr. Theobald, of Baltimore, in 1875.

The third chapter, "on Ear-Cough, and Laryngeal Complications dependent on Ear Disease," is one of great interest, and contains a successful explanation of the above-named phenomena. Ear-cough is shown to be due to "irritation of the sensitive fibres of the auriculo-pneumogastricus distributed in the meatus, which is reflected along the motor fibres of the superior laryngeal nerve, exciting in the larynx the act of coughing, by causing contraction of the crico-thyroid muscles," etc. If this irritation is kept up, functional derangement may become

structural lesion, by involvement of the vaso-motor fibres associated with the auricular branch of the pneumogastric nerve. They conduct the irritation to the pneumogastric ganglion, and from this subcentre it is deflected to the first cervical ganglion. This latter furnishes the *nervi molles* to the external carotid artery and its branches, and, therefore, to the vessels of the mucous membrane of the larynx. By impressions conveyed over this nervous tract, congestion of the vessels of the larynx ensues, and effusion or hypersecretion in this organ takes place.

In the fourth chapter, Giddiness, and the connection between Stomachic and Labyrinthine Vertigo, is explained. Our author has already rendered our readers familiar with his views on these subjects through an article which he published in the number of this Journal for April, 1878, and of which this chapter is a reprint.

The fifth chapter is devoted to a consideration of the Etiology, Diagnosis, and Treatment of Noises in the Head, *i. e.*, of *tinnitus aurium*. Here the vertebral artery, and its connection with the lower cervical ganglion, are adduced very successfully to explain the *tinnitus* due to morbid circulation in the labyrinth. Pulsating noises are explained as the result of a dilatation of the internal auditory artery. Whenever the pulsation is undefined, or associated with buzzing and singing in the head, the author treats the case with hydrobromic acid, since Dr. Fothergill has suggested that this drug antagonizes the symptoms of cinchonism, which the aural disease in question resembles. The dose employed has been 15 minims in water every four hours.

The author then alludes to *tinnitus* which occurs in *anæmia*, aneurism of the aorta, intercranial aneurism, by which is meant, we suppose, *intra-cranial* aneurism, and in an overloaded condition of the portal circulation. *Inter-labyrinthine* is used for *intra-labyrinthine* on p. 89, and on p. 85 the tensor tympani is spoken of as the "extensor muscle;" but doubtless these will be corrected in a future edition. The treatment recommended for the nares, as well as that proposed for the Eustachian tube (p. 102 and p. 117), we cannot regard with favour, as it seems hazardous.

We agree with the author in his opinion that nitrite of amyl is not as potent to quell *tinnitus aurium* as has been claimed. The book before us must be considered a great and decided addition to the etiology of some of the most obscure aural symptoms, but we regret that, on the other hand, the surgical treatment is, as a rule, one that we must dissent from, as being liable to irritate rather than soothe an organ, which the author presupposes to be in a condition of reflex-irritation. As a guide in the diagnosis of some forms of aural disease, however, we regard the work as indispensable.

C. H. B.

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ART. XXVII.—*Cyclopædia of the Practice of Medicine.* Edited by Dr. H. VON ZIEMSEN, Professor of Clinical Medicine, Munich, Bavaria. ALBERT H. BUCK, M.D., of New York, Editor of American Edition.

Vol. XIII. Diseases of the Spinal Cord and Medulla Oblongata. By Prof. WILHELM HEINRICH ERB, of Heidelberg, Baden. 8vo. pp. xii., 975.

Vol. XVII. General Anomalies of Nutrition and Poisons. By Prof. H. IMMERMANN, of Basel; Prof. R. BOEHM, of Dorpat; Prof. B. NAUNYN, of Koenigsberg; and Prof. H. VON BOECK, of Munich. 8vo. pp. xiv., 968, etc. etc. New York: William Wood & Co., 1878.

PROF. ERB, the sole author of Volume XIII., does not need a formal introduction to our readers, as a brief sketch of his life and work appeared in the



number of this Journal with the notice of Volume XI., on Diseases of the Peripheral Cerebro-spinal Nerves, the preparation of which was also entirely entrusted to him. The subject of the present volume is one of great interest to physicians, for perhaps no branch of pathology has recently made as rapid advances as that embracing diseases of the spinal cord and medulla oblongata. In the course of little more than twenty years, through the labours of Romberg and Duchenne, we have learned to distinguish locomotor ataxia from other forms of spinal disease, while our knowledge of multiple sclerosis and of sclerosis of the lateral columns is much more recent. Charcot's description of multiple sclerosis is so admirable and so true to nature that other observers have been able to add little or nothing to it. The author, however, proposes a different explanation of the volitional tremor, which is one of the characteristic symptoms of the disease. It is well known that Charcot attributed it to the relatively long persistence of the axis-cylinders in the sclerotic nodules, because, in his opinion, the impulse of the will would be conducted through the naked axis-cylinders only in a sort of jerking manner. Prof. Erb, on the contrary, thinks it is much more likely to be due to the involvement of certain parts of the brain in the disease. With a special view to the decision of this question he has recently examined twenty-two cases of this disease. In all of them, which had presented the tremor during life, he found sclerotic patches in the pons, medulla oblongata; and pedunculi, as well as in other portions of the brain and spinal cord; while in the few cases in which tremor was absent during life, although nodules existed elsewhere in the brain, there were either none at all or at most small ones in these portions of the brain or in the cerebellum. Ebstein has also reported a case in which the spinal cord was alone diseased, and in which during life there had been ataxia, but no tremor. On the other hand, in a case observed by Kelp, which belonged to the purely cerebral form, the tremor was present. Hammond and Ordenstein are also of the opinion that tremor is absent in the purely spinal cases.

The author's remarks on the treatment of this disease are few. They show, however, that his results have not been more favourable than those obtained by other observers. Nitrate of silver has proved useful in some cases, but unfortunately its effects are only temporary. In one case the cold water treatment was followed by improvement, and in another the subcutaneous injection of arsenic seemed of service. In this last case the patient was benefited at a later period by the galvanic current. On the other hand, he has seen nothing but harm come from the use of warm baths, chloride of gold, phosphate of zinc, belladonna, strychnia, ergot, and bromide of potassium.

In an argument which want of space alone prevents us from reproducing in full, Prof. Erb shows conclusively that the ataxic symptoms of locomotor ataxia, or, as he prefers to call the disease, *tabes dorsalis*, cannot be referred exclusively, if at all, to disturbance of sensibility. In fact they bear no proportion in degree to the intensity of the latter, severe ataxia being often observed where there is little or no impairment of sensation, and, on the contrary, being entirely absent even in cases of complete spinal anaesthesia, as in the case reported by Schueppel and Spaeth. He concludes, therefore, that the ataxia in *tabes* can by no means be the effect of the derangement of sensation which may happen to coexist, but that it must rather depend upon a disturbance of co-ordinatory tracts lying within the spinal cord, and that it is therefore a motor ataxia. While the possession of sensibility is indispensable to enable us to acquire the faculty of making co-ordinate movements, it is not necessary that it should be retained in order that we should continue to perform those acts which have already been learned.

The author is not able, however, to tell us where to look for these co-ordinating

tracts. They can scarcely lie in the posterior columns, for these have been found extensively diseased in cases in which ataxia has not been present. They are situated more probably, he thinks, in the lateral columns.

The reader will find among other subjects fully discussed in this admirable volume, that of the tendon reflexes, which was brought to our notice only a year or two ago by Westphal. If in health a tendon is struck, and especially the ligament of the patella, an immediate contraction of its muscle takes place. This effect is very much diminished in some diseases of the spinal cord, as, for instance, locomotor ataxia, and increased in others, as, for example, sclerosis of the lateral columns. The contraction of the muscle is, under these circumstances, the author claims, a true reflex action, and not produced, as asserted by others, by the direct action of the blow upon the muscles. It is often seen in diseases where no reflex action is produced by irritation of the skin, and its importance in a diagnostic point of view cannot well be overrated. A very similar symptom, and occurring in disease generally under the same circumstances as the preceding, is the treiner of the foot and leg, which is produced by suddenly flexing the foot, and to which Westphal has given the name of "ankle clonus."

In addition to the articles in this volume, which we have thus briefly noticed, we wish to call special attention to the general remarks on the physiology and anatomy of the spinal cord, and to those on the symptomatology and etiology of its diseases.

The writers for Volume XVII. are more numerous, but are less well known, none of them having, we believe, with the exception of Immermann, contributed articles to any of the preceding volumes of the work. This gentleman appears in the present volume as the author of the chapter on "General Anomalies of Nutrition," under which head hæmophilia, scurvy, and purpura hæmorrhagica are described. In his article on the first of these conditions he very fully recognizes the value of the contributions made to its literature by some of the early American physicians, including Drs. Otto, Smith,<sup>1</sup> and Hay, the existence of which had almost escaped from the memory of our own people, until recalled a few years ago by Dr. R. P. Harris, in a notice of Dr. Wickham Legg's book on this disease in the *Philadelphia Medical Times*. The author shows from statistics that the disease occurs more frequently in certain countries than in others. Thus in Germany it seems to be exceptionally common; next to Germany in the order of frequency comes Great Britain, followed by the northern countries, Sweden, Norway, and Denmark; then North America, Holland, Belgium, Switzerland, Russia, and Poland. But few cases have been reported from France, and none from Italy, Spain, Portugal, Greece, and Turkey. A remarkable predisposition seems to exist also in the widespread Jewish race, since the disease has been repeatedly noticed among this people in connection with the rite of circumcision, while of the total number of bleeder families, thus far reported, a considerable proportion have been among Israelites. The prevalence is, therefore, little influenced by climatic differences, and the same remark will apply also to the elevations of the regions affected; cases being reported from the lowlands of Holland as well as from the high Alpine valleys of Switzerland. Dr. Immermann refers very fully to the well-known fact that while the males of the bleeder families suffer in much larger proportion than the females from the active form of the disease, the latter are very much more likely to transmit the disease to their offspring. He attempts,

<sup>1</sup> In a note the translator refers to a letter written by Dr. E. H. Smith, of New York, in 1794, to Dr. Rush, of the same city. Dr. Brayton Hall, of New York, the translator of this article, probably is ignorant of the fact that Dr. Rush was wholly identified with Philadelphia, but it is difficult to understand how the American editor should have allowed such an error to pass uncorrected.

in the section on Pathogenesis, to explain the immunity which they enjoy in a way which, we think, will hardly be generally accepted.

Some writers have asserted that the blood in patients suffering from this disease is deficient in the red-corpuscles and fibrin, but this is, in the author's opinion, a mistake dependent upon the fact that the blood examined is generally obtained during the latter stages of the hemorrhage, when it has undergone the typical changes belonging to acute anæmia. The blood at the outset of hemorrhage is, he says, not paler in colour than in healthy persons. It maintains its coagulability also for a long time during the hemorrhage, and does not acquire the above-mentioned watery quality until late in the attack. So far from being wanting in red blood-corpuscles and fibrin, it actually contains an unusually large amount of these elements; and is, moreover, characterized by a comparative poverty in leucocytes.

The author also attaches very little importance to the existence of anomalies in the position of the cutaneous and subcutaneous vessels, consisting in an unusually superficial course of the same, upon which some observers have laid so much stress. In addition to this, structural changes in the arteries, such as a striking delicacy of their walls, and an abnormal narrowness of their lumina, have also been pointed out. But the presence of these changes, as well as of hypertrophy of the heart, has by no means been proved in all cases, and even where they undeniably exist he regards them as subordinate to another factor in the disease. This he holds to be "the habitual existence of a high degree of absolute plethora," to which sufferers from this disease are liable. In support of this opinion he adduces the following facts: 1, the peculiar congestive symptoms which so frequently precede by a shorter or longer interval the spontaneous bleeding in these individuals, and which may very reasonably be interpreted as a sign of vascular engorgement; 2, the surprising toleration of excessive losses of blood; and, 3, the equally remarkable, complete, and rapid restitution of the volume of blood. Of course, in cases where the vessels are thin and superficial, a moderate amount of plethora will be sufficient to excite the bleedings, a result which will be still more likely to take place, if hypertrophy of the left ventricle of the heart, as is not unusual, be found to coexist.

We have already referred briefly to the fact that Immermann attempts to explain the immunity from the active forms of this disease, which the women of bleeder families as a rule enjoy, while retaining the power of transmitting the diathesis to their male offspring. There is nothing unreasonable, he says, in the supposition that the maternal predominates over the paternal influence in the development of the vessels and blood in view of the known relations of the so-called parablasic tissue to the maternal organism. It will generally be admitted also that the disposition to plethora is stronger in the male sex—a condition which he believes is further prevented in the female by the periodic occurrence of the menses, which act, he says, is a very effective derivative, preventing overfilling of the vascular apparatus, and the formation of a congestive diathesis. But will this hypothesis—for it is nothing more—ingenious as it is, serve to explain the almost constant escape from fatal hemorrhage of the women of bleeder families during the act of parturition? For it must be remembered that pregnancy is not only frequently attended by plethora, but also puts a stop to what the author calls "a very effective derivative." Perhaps he has felt this difficulty as well as ourselves, for he does not allude to the effect produced by child-bearing upon this class of women.

Holding the views he does of the pathology of hæmophilia, it is not extraordinary that Immermann discountenances the use of iron except in the condition of anæmia which follows a copious hemorrhage. With Legg, he holds that it is better not to check a spontaneous hemorrhage too soon, considering it a relief to

the plethora, but recommends ergot and acetate of lead, together with rest, in controlling it when it becomes excessive. He expresses the belief, however, that the only way to eradicate the malady from a community is to prevent by law the marriage of the women of bleeder families, as they are alone likely to transmit the disease to their children. It will thus be seen that the author's conclusions in regard to the disease do not differ materially from those already reached by Dr. Legg.

We had intended, before closing, to refer briefly to a few of the chapters on "Poisons," but unfortunately this notice has already outgrown the limits assigned to it, and we have therefore only room to say that we have found those we have read both interesting and instructive.

J. H. H.

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ART. XXVIII.—*Transactions of the Obstetrical Society of London.* Vol. XX.  
For the Year 1878. Pp. 346. London: Longman, Green & Co., 1879.

THIS is quite a small volume compared with some of its predecessors, and abstracts of several of its articles have already appeared in this Journal. We shall therefore present but a short notice of it, and only call attention to those articles which have not been already laid before our readers.

Dr. CHAMBERS reports a case of *extirpation of the uterus* and ovaries for the removal of a fibro-myoma, the whole mass weighing 14 pounds. The patient was single, æt. 36, and had had good health up to five years before the operation. There was but little hemorrhage. She gradually sank, and died in 26 hours. Wound healthy; no peritonitis; no flatus in the bowels; no fluid in abdomen; no hemorrhage. A small portion of the elongated and adherent fundus of the bladder had been included with the ligature, and cut off in the removal of the uterus.

Mr. LAWSON TAIT reported two remarkable cases of the repair of the female bladder and urethra after vesico-vaginal fistulæ, the result of extensive sloughing, in one of which the opening had existed for fifteen years. In the first woman the amount of urine retained was at first but half an ounce, but this gradually increased to four ounces. In the second case, the one of fifteen years' standing, the bladder gradually expanded so as to hold an ounce, then several, and finally up to nine ounces. The principle upon which Mr. Tait operated is said to be original with him, and a great step in advance of former expedients, enabling cures to be produced in cases formerly regarded as beyond remedy.

The plan adopted by the operator will be understood by a few extracts from his paper. He says of the first case: "My idea was that if I could make anything in the shape of a tube out of the cicatricial tissue in the vaginal wall, I might then, by releasing the ridge at each side, bring it and the uterus down, and by folding the remains of the bladder upon itself, and fastening it to the new tube, I might at least make a receptacle for a small quantity of urine." The first attempt failed. In the second, he made his incisions longer and wider apart, as follows: "I made two almost parallel incisions an inch and a half apart, and rather more than an inch long, running in the axis of the symphysis pubis and equidistant from it. With the aid of my staphylorrhaphy raspatories I lifted up two flaps consisting of everything I could raise from the bone, and again united them in the middle." The parts were not examined for two months, at the end of which time "I found that a canal three-quarters of an inch in length, and sufficient in diameter to allow a No. 6 catheter, had been formed." The stitches

were removed, and, after a few days, the second step of the operation was performed as follows:—

“I first of all made a raw surface at each side of the ridge at its upper end, this surface having a crescentic form, and extending over one-fourth of the circumference of the passage on either side. I then made a deep incision at each end of the tense ridge at the upper part of the vagina, cutting until I felt the whole mass, including the uterus, move when I drew upon it.” “I then pared the edge of the ridge, and fastened it down to the raw surface by passing sutures wherever I could find any tissue to hold them. I left, however, one corner, the right one of the square flap, unattached, so that at this point there was free exit for the urine.”

All the parts united; and the third step of the operation closed the provisional orifice at a later date, the whole of the proceedings covering a period of four months. The bladder began by degrees to retain a little water, and finally the woman was enabled to keep dry from half an hour to three hours, never wetting her bed at night.

The urethral restoration of the second case was the same. The narrow part of the fistula was closed, by drawing and stitching the parts together, and the wide, after two trials, by wedge-shaped side flaps from the vagina. As there was less destruction of bladder, the viscus had eventually a much larger capacity than in the former case.

Dr. J. BRAXTON HICKS reports another fatal case of *Cæsarean operation* in a woman in her ninth month of utero-gestation, who was affected with cancer of the rectum involving the vagina. The uterine wound was closed with eight silk sutures, which were all found to have been torn out after her death, which resulted in 24 hours, from prostration, slight peritonitis, and the escape of fluids into the peritoneal cavity. The child lived, and was doing well when six months old.

Dr. DUNCAN C. MCCALLUM, of Montreal, describes the case of *conjoined twins*, “*Marie-Rosa Drouin*,” who were born in St. Benoit, Canada, Feb. 28, 1878, and who, it will be remembered, were exhibited in Philadelphia last October, when 7 months old. They differ from the Ohio twins, also shown here, in the fact that they are united at an obtuse angle instead of in a straight line, and the double leg opposite the pair of legs is a very small appendage.

Dr. AVELING, in an article on *the curves of midwifery forceps*, gives the credit of having invented the pelvic curve to Mr. Benjamin Pugh, of Chelmsford, Essex, England, who, in a work on Midwifery, in 1754, states that he contrived it fourteen years before, or in 1740. Mr. Pugh, it is also claimed, was the first to apply the forceps above the superior strait.

Dr. JOHN WILLIAMS, in a paper on *changes in the uterus resulting from gestation*, drew attention to the wrinkled condition of the lining membrane of the uterine arteries after involution following delivery, as an evidence of the former existence of pregnancy in suspected subjects. Dr. W. found this condition to exist as long as fifteen years after the last pregnancy, in a patient of 55, who had ceased to menstruate for eight years, and whose uterus had undergone senile atrophy. He had never seen it brought about by disease, or observed it in the virgin organ. The corrugation is believed to be due to an imperfect restoration of the arterial calibre after great distension and hypertrophic enlargement, the vessels being made small, but not smoothly contracted.

Dr. GEORGE ROPER reported the existence of a variety of *anteflexion of the uterus*, which originates in the fœtus, and does not depend upon any pathological changes in the uterine tissues. In these cases the sound is introduced with difficulty, and the organ may be straightened, but will resume its curve by its own elasticity, as soon as the instrument is withdrawn. Dysmenorrhœa and sterility are common attendants of the condition, for the removal of which various schemes

have been advised, Dr. Roper recommending the gradual dilatation of the parts affected, by means of metallic sounds.

Dr. WYNN WILLIAMS preferred to rely upon the insertion of the vulcanite stem, supported on an India-rubber shield, the latter being made of thin rubber stretched across a small modified Hodge pessary, and perforated with holes. He had treated between sixty and seventy cases of antelexion at the Samaritan Hospital during the last two years, nearly all in this way, without untoward result. "He frequently received letters stating that women had become pregnant after the insertion of the stem and shield."

In a long discussion that followed the reading of Dr. Roper's paper, we find how diverse are the opinions of the profession upon the safety and usefulness of the stem pessary. As the theory upon which the instrument was devised appears to be a correct one, it is to be regretted that it has so often led to dangerous if not fatal results. The non-metallic flexible stems, based upon yielding supports, all of India-rubber, appear to offer the greatest measure of safety, although nothing is absolutely safe that is inserted into the uterus.

R. P. H.

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ART. XXIX.—*Handbook of Diagnosis and Treatment of Diseases of the Throat and Nasal Cavities.* By CARL SEILER, M.D., Lecturer on Laryngoscopy at the University of Pennsylvania; Chief of the Throat Dispensary at the University Hospital; Curator of the Pathological Society, etc. etc. 12mo. pp 156. Philadelphia: Henry C. Lea, 1879.

THE author of this work disclaims in his preface the intention of writing a book based upon theory, and says that "only points of practical importance have been discussed," and declares that in carrying out this purpose he trusts his book "may be used as a ready book of reference on the subjects of which it treats."

In order to accomplish his objects, he has taken up one-third the space allotted to his entire work in the description of the laryngoscope, the art of laryngoscopy, the laryngeal and rhinoscopic images, etc. etc. In nearly all of these details he agrees with the many classical authors who have written on the subject. In some points of this part of the author's work, in which he separates himself from other writers, we cannot agree with his stated experience. For example, on page 16, he finds the spectacle frame of Semeleder "insecure" and "tiresome;" and for the inspection of the posterior nares (p. 37) "the larger the mirror that can be borne by the patient, the better can the cavity be illuminated."

In the chapter devoted to the instruments accessory to laryngoscopy, etc., he gratuitously affirms that most remedies employed as applications to the mucous membrane of the throat and nasal cavities are used in solution. In our daily practice, as well as in that of many well-known specialists, powders are actually much more frequently used than solutions. In fact we have come to regard their curative properties as more valuable and freer from objections.

The author uses the term "traumatic" on many occasions, and usually, as we believe, incorrectly. It is scarcely proper, it seems to us, to say that inflammations caused by the inhalation of irritant vapors (p. 51) are *traumatic*, or that acute laryngitis, if *traumatic*, may be caused by the inhalation of dust (p. 58).

In advising the use of nitrate of silver as an inhalation from the atomizer, we would like some mention to be made in regard to the utility of a face protector. Again, it is an error to affirm that local applications of solid nitrate of silver to chronically inflamed tonsils are used with doubtful results, for we know of no

more efficient remedy when fused upon an aluminium probe and introduced deeply into the lacunæ of these organs.

The description of acute laryngitis is too concise to be thorough; and, inasmuch as important symptoms, such as stridulous respiration, etc., are not even mentioned, we cannot believe that accurate diagnosis will be aided in great measure by its perusal.

We might go on to the end and find many faults in this little work, which would be far better if sins of *commission* and *omission* were remedied. We do not wish to be severe, but really of what use is such a work? In Reynolds's *System of Medicine* we have quite as good a compendium of the diagnosis and treatment of throat diseases; and in the work of Browne, or Cohen, there is everything and more than is here put down. If special treatises must be written now-a-days in great abundance, let them at least contain novel investigations or plausible theories on debated questions. Let them have here and there a few illustrations which come from the author's own storehouse. The work before us has no special merit other than that it is small and of moderate price. It contains only what is already familiarly known. It errs by making the statement of facts so brief as to omit essential ones; and whenever the beaten track is left, the author's convictions are not narrated in such a way as to require more than very moderate commendation.

B. R.

#### ART. XXX.—*Hygiene of Sight.*

1. *Die Schulhygiene auf der Pariser Weltausstellung, 1878.* Beurtheilt von HERMANN COHN, Dr. med. et philos. a. o. Professor der Augenheilkunde an der Universität zu Breslau. Mit 2 Tafeln Abbildungen. Breslau. Verlag von E. Morgenstern, 1879.

*School Hygiene at the Paris Exhibition of 1878.* Critically examined by HERMANN COHN, M.D. et Ph.D., Extraordinary Professor of Ophthalmology at the University of Breslau.

2. *School Life in its Influence on Sight and Figure.* Two Lectures by R. LIEBREICH, Consulting Ophthalmic Surgeon to St. Thomas's Hospital. London: J. & A. Churchill, 1878.

THE alarming increase of myopia, and especially its prevalence among young people of both sexes in city schools, must have caused many observant biologists to speculate as to the exact mechanism by which the unfavourable influences of our present civilization were at work, so as to bring about this rapid deterioration of the visual organs in the last few generations of mankind. These observations of Prof. Cohn, in conjunction with his previous investigations, have done much to explain and point out the means of avoiding this serious degeneration of our most important sense, and the less original lectures of R. Liebreich have been useful in bringing the subject before the English public. Little attention has, however, been paid to the matter in America, and we therefore propose to give our readers a somewhat extended notice of the conclusions to which these two high authorities have arrived.

In a previous essay presented before the Ophthalmological Congress of Heidelberg, in 1865, Prof. Cohn reports that among 10,060 students and pupils of all classes, he found 1004 myopes. All the schools in which he made his investigations included some near-sighted individuals, but in the village schools these unfortunates were found in the proportion of only 1.4 per cent., whilst in city schools 11.4 in every hundred were affected with myopia. Furthermore, in the

primary city schools the proportion was 6.7 per cent. In schools of the second grade, myopes were met with in the proportion of 10.5 per cent. In normal schools the percentage rose to 19.7; and in the Gymnasia, or highest schools, to 26.2. In the first class of the Gymnasia *more than half* the pupils were myopic.

From the researches of our author, with those of Erisman (of St. Petersburg), and others, it seems indubitable that the work of reading and writing brings about lamentable development of myopia.

It is certain that myopia is hereditary, and that, according to the great law of the extinction of the unfit, the children of myopic parents are predisposed to the development of this disease, so that they will certainly suffer from it, if exposed to conditions which would be apt to engender near-sightedness in normal eyes quite free from any taint of hereditary tendency. We are, therefore, as a people threatened with an infinite increase of myopia, unless preventive medicine can devise some efficient sanitary precautions for counteracting the injurious effects of prolonged application in the school-room upon our visual organs.

Among the general deductions reached by Cohn and others the following are the most important:—

In the first place study-rooms should be well lighted during the day, and especially toward evening, because a feeble or badly arranged light compels us to diminish the distance between the eye and the book whilst reading or writing.

Light should be allowed to enter from the left side. Illumination from the front is more or less dazzling, and obliges the pupils to bend forward too much, or to sit side-wise in constrained and fatiguing positions. Again, light coming from behind is entirely insufficient, because in great measure cut off by the head or upper part of the body of each scholar.

The windows of a school-room should be large and high, be arranged along the left side of the apartment so as to shed the light upon desks placed in rows at right angles to the wall in which they are cut.

The light from above furnished by a skylight is not so good as that derived from lateral illumination. The light of lamps is recommended as being preferable to gas, and the gas light shining through ground glass globes is condemned as particularly objectionable.

The inclination of the desk at which the pupil sits to read or write is a matter of no small importance. Desks which are horizontal, or only slightly inclined, favor the development of myopia by compelling the scholar to bend the head over a good deal whilst reading or writing. Such a position brings on, as a mere result of weight of the blood, passive congestion of the head and eyes, and this results in an intra-ocular tension, insensible perhaps when it first appears, but very marked in its effects when long and constantly continued. Besides, a child who acquires the habit of leaning forward in this manner, is very apt to bend nearer and nearer his book as the muscles of the back become fatigued, and thus, by straining his power of accommodation at short focus, promote the rapid development of myopia. The desks of school children should, therefore, be sharply inclined at an angle of  $40^{\circ}$  or  $45^{\circ}$  when used for reading, and their seats should not be too high, and should be furnished with comfortable backs.

Great care should be taken to secure school books well printed in large, clear type; since those printed in small, indistinct letters, upon bad paper, with poor ink, as in the case with too many of the classics and the dictionaries in common use, necessitate a close approximation of the eyes to the page, and consequently exaggerated efforts at accommodation favouring myopia.

Furthermore, all punishments of school children which consist in depriving



them of recreation or exercise out of doors, or in adding to their amount of study, and consequent employment of the visual apparatus, should be relinquished.

Dr. Cohn gives us some valuable comments upon the various models of school-houses, furniture, etc., displayed in the French Exposition, quoting from the Architect's (Stanislas Ferrand) pamphlet upon cheap model school-houses, as follows:—

“We draw near now to the time when the most *spiritual* people upon earth are seriously undertaking to learn to read and write, and by this means raise themselves, through the modern extension of public liberty, to the rank of civilized nations, respecting whom an illustrious citizen has said: ‘The people which has the best schools, is the first people; if it is not so to-day, it will be so to-morrow.’”

Visitors to the Exposition, and especially those of us who were fortunate enough to enjoy the aid of the admirable plans and guides to objects of hygienic interest, furnished to its members by the Congrès International d'Hygiène, will doubtless recall the pretty little school-house near the southern corner of the Champ de Mars, close to the Avenue de la Motte-Piquet. To this model of economical efficiency, our author devotes over seven pages of description, and generally approving comment, although he considers the ingenious system of ventilation adopted by Ferrand as unnecessary, complicated, and expensive.

The plans and models of school-houses displayed by other countries, are also carefully noted, but much less fully described. In regard to the United States, Nos. 15 and 16 upon Dr. Cohn's list, we find the following:—

“In a special room of the American section, is found the collective exhibition in regard to national education. Here, among innumerable books and charts, stands the large model of an elementary school in Washington, furnished with a great many windows, the proportion of which, to the superficial area of the room, could not, however, be calculated.

“The same may be said of a second very large model of the Indiana State Normal School, at Terre Haute, supplied with numerous Gothic windows, but with the floor space of the class-rooms uncertain.”

Dr. Cohn declares that a school-room cannot be too well illuminated, and, on page 12, recommends what seems to us the exaggerated proportion of 1 square foot of window area to each square foot of floor space. In any case he maintains the window area should be at least 30 square inches to every square foot of floor surface.

The remainder of our author's essay is chiefly taken up with a minute description of the school furniture, especially desks and seats, exhibited by most of the civilized nations of the world. The minor differences of these could, however, with difficulty be appreciated without the aid of the numerous outline drawings supplied in Cohn's second plate, and we must therefore refer our readers to the brochure itself for these latter details.

The general principles which must be kept in view in the construction of seats and desks for school children, are deduced from the investigations of Cohn, Erisman, Fahrner and others; and are accessible to those who are not familiar with French and German, in Liebreich's lectures. According to this observer, the faults of school furniture, which give rise to injurious postures, and so conduce to myopia and asthenopia, as well as to scoliosis or lateral curvature of the spine, are:—

“1. Want of, or unsuitable backs.

“2. Too great a distance between the seat and the desk.

“3. Disproportion; generally too great a difference between the height of the seat and that of the desk.

“4. Wrong form and slope of the desk.”

Liebreich gives a very clear exposition of the way in which these defects cause the diseases already mentioned, and concludes with the subjoined recommendations, which he considers, however, less advantageous than what he calls the American plan of having the seat and desk made to every child's measure; or the Swiss system, when seven or more different sizes of seats and desks are manufactured to suit the different classes:—

"1. One and the same size and model of desk should be used for children and grown-up persons of both sexes.

"2. The adaptation to the height of each child should be effected by varying the height of the seat and the foot-board.

"3. The edge of the table is always to be in a perpendicular line above that of the seat.

"4. No seat is to be without a back, and the top of this is always to be 1 inch lower than the edges of the table for boys, and 1 inch higher than the edge of the table for girls.

"5. In all classes where the boys change places, the height of the seat is to be regulated in proportion to the average height of the pupils.

"6. In all girls' schools, in all those boys' schools where the children do not change places, in boarding schools, and in private school-rooms, the seat of each child should be accurately regulated in proportion to its height."

The support for the back should incline only a few degrees from the perpendicular, and be so arranged as to press upon the spinal column just above the hips of the pupil. The breadth of the seat ought to be considerable, in order to support most of the thighs, and its height just such as to allow the feet to rest easily upon the foot-board. The desk should be so arranged, by means of a hinged flap or otherwise, as to hold the book at an angle of  $40^{\circ}$  or  $45^{\circ}$  whilst reading, and the paper at an angle of  $20^{\circ}$  whilst writing is being performed by the scholars.

J. G. R.

ART. XXXI.—*Demonstrations of Anatomy; being a Guide to the Knowledge of the Human Body by Dissection.* By GEORGE VINER ELLIS, Emeritus Professor of Anatomy in University College, London. From the eighth and revised English edition. 8vo. pp. 716. Philadelphia: Henry C. Lea, 1879.

THIS book is intended for use in the dissecting room, and is designed to aid the student while at work with scalpel and forceps. Accordingly the different regions are discussed in such a manner that the muscles, vessels, and nerves are described, as found in each situation, without following out their distant distribution. This method is, obviously, well adapted to the end for which it is designed. A serious omission, however, is the absence of any description of the bones of the part. It is proper enough to begin with the superficial structures and gradually descend to the various layers of muscles, the vessels, nerves, and ligaments; but why neglect to touch osteology, upon a correct appreciation of which the knowledge of myology, etc., must depend? It may be said that the student should know the characteristic markings and processes pertaining to the skeleton, but the fact remains that he does not; and, moreover, those who teach practical anatomy will sustain the assertion that many a student begins to dissect who has never even handled more than one or two human bones. After he has finished his part he may be taken to the skeleton, when it is more than probable that he will have no adequate idea of the attachments of the muscles which he has just seen. A few wood-cuts of the bones, and a short description of them, would be a valuable addition to the volume. Another objection is the fact that the illus-

trations are small and the structures represented by them referred to by figures and foot notes, which is a method far inferior to printing the names directly upon the part, as is now done so frequently in such text-books as those of Holden and Gray. A manifest improvement, however, is the repetition of cuts where the text speaks of parts that have been previously represented, but not described. This avoids the inconvenience of turning back to hunt an illustration many pages distant. Examples of this arrangement are seen in figures 2 and 9, 1 and 6. Other excellent features are the tables of the arteries, veins, and nerves of the region, which are added at the ends of some of the chapters, and serve as a recapitulation.

The author has very properly devoted several pages to the delineation of the cerebral convolutions and fissures, which, at the present time, should be included in all anatomical treatises, since the study of cerebral localization has received so much attention. The dissection of a number of brains some years ago, when Ecker's little book on the convolutions appeared, showed the reviewer that the surface topography of the brain was sufficiently constant to deserve notice in our ordinary anatomical rooms, though usually but little attention is paid to it. The chapters on the special senses are well worth careful attention on the part of the student.

The volume before us must be recognized as a good guide for the anatomical room, but a perfect dissector's manual has not yet been published. Some experience as a teacher of practical anatomy has shown the present writer that there is need of a book, of six or seven hundred pages, which shall contain large wood-cuts, with the name of each part printed upon it, as is done in Gray's *Anatomy*, and a concise description of the bones, muscles, vessels, and nerves. The systematic treatises on anatomy are too large for convenience, and too detailed to render the main facts sufficiently prominent. Such a work would doubtless command a ready sale, but until something of this kind is furnished us, we must feel the value of such works as that just reviewed.

J. B. R.

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ART. XXXII.—*Recent Works on Skin Diseases.*

*Epitome of Skin Diseases, with Formulæ, for Students and Practitioners.*

By TILBURY FOX, M.D., etc., and T. C. FOX, M.B., etc. Second American edition, enlarged and revised by the authors. 12mo. pp. 216. Philadelphia: Henry C. Lea, 1879.

*Notes on the Treatment of Skin Diseases.* By ROBERT LIVEING, A.M., M.D. Cantab., etc. Fourth edition, revised and enlarged. 12mo. pp. 130. New York: William Wood & Co., 1878.

THESE two little volumes may properly be considered in connection, since their general aim and scope are the same. The present edition of Dr. Fox's book shows decided improvement over the first edition published in this country three years ago. While the volume is only a little larger than before, it contains three times as much matter. In fact it is rapidly assuming the rank of a treatise. The section on pathology has been recast, and this, together with the remarks upon methods of examination in diseases of the skin, forms the most satisfactory part of the book. Dr. Fox's classification cannot be entirely commended, and it is especially confusing when compared with the order in which the various diseases are described, an order, like that followed by Dr. Liveing, purely alphabetical. This confusion is somewhat increased by the interpolation, on the part of the American editor, of a third system of classification, that adopted by

the American Dermatological Association. There is much to commend, however, in this little work, and especially the careful revision of the text, bringing it up to the present state of our knowledge, and, what is unusual, giving credit to American dermatologists for work done. The full cutaneous pharmacopœia which this book, like Dr. Liveing's, contains as an appendix, remains almost without change as in the first edition, and the inquiring dermatological tyro can "stick in his thumb, and pull out a plum" almost wherever he pleases—if he only knows just which plum he wants.

Dr. Liveing's book has reached its fourth edition, and thus appears to enjoy popularity among those who appreciate the class of works of which it is a good example. The description of the various diseases is brief, but as clear as is possible in a limited space, and the treatment suggested is fully up to date. But when we come to classification and arrangement there is confusion. After giving a modification of Hebra's classification, Dr. Liveing passes on to discuss the different affections in *alphabetical* order. This is fatal to the attempt at obtaining a distinct idea of the relations of the diseases to each other. A further examination shows such statements as the following: "Prurigo, in most cases (at least in this country) is due to pediculi." "The sudden healing of open discharging sores is sometimes attended with unpleasant consequences." This is not the teaching of the dermatology of the present day, and it is a pity these obsolete notions should continue to be propagated among the profession at large.

A. V. H.

ART. XXXIII.—*Ophthalmic Out-patient Practice*. By CHARLES HIGGINS, F.R.C.S., Ophthalmic Asst. Surgeon Guy's Hospital, Lecturer on Ophthalmoscopy Guy's Hospital Medical School. Second Edition. 8vo. pp. 116. Philadelphia: Lindsay & Blakiston, 1879.

THIS little book seems designed to convey such general and elementary knowledge as would be given to a class of students in attendance upon the "clinics" of an ophthalmic dispensary.

In glancing at the table of contents we were, at first, unfavourably impressed with such headings of sections as "Discharge from the Eyes," "Intolerance of Light," and "Watering of the Eye;" but were agreeably disappointed to find diseases of the conjunctiva, of the cornea, and of the lachrymal apparatus treated very clearly and with admirable conciseness. We still object, however, to this use of prominent symptoms, and think that its inconsistency is shown by the fact that the first symptom mentioned under the head of "*Iritis*" is "some watering of the eye," and the admission that in "*Interstitial Keratitis*" "intolerance of light is rather a variable symptom."

An immense amount of misery has resulted from the failure, too often on the part of even experienced practitioners, to recognize *iritis* and *glaucoma*. The chapter on these diseases is excellent, and, in some ten short pages, contains practical information enough to prevent any one who reads it and remembers it from making this grave mistake. The "busy practitioner," who has not the time or the inclination to study more extended accounts of these diseases, would not do amiss to get this one by heart.

In regard to treatment, the familiar picture that the author has given us of the routine of practice at Guy's differs but little from that of the "out-patient" departments of ophthalmic hospitals in this country. To a few points of difference, however, it may be well to call attention. Iodide of potash, which is not men-

tioned by the author in this connection, is generally relied upon in the treatment of *interstitial keratitis*; and we doubt if many would agree with him in the use of leeches in *suppurative keratitis*. The effect of eserine in diminishing the tension of the ball is pretty well established, and it is considered a valuable remedy in *glaucoma*, particularly in doubtful cases in which immediate operation might hardly be justified. In lachrymal obstruction we would not expect the benefit that the author seems to claim, from merely slitting up the canaliculus, except in the rather rare cases in which the obstruction is seated in this part of the lachrymal apparatus; and the advice that "In any case—even if no improvement take place—we should abstain from further operative interference for five or six weeks" is not in accordance with our practice. In a large proportion of cases, this would merely subject the patient to unnecessary delay and loss of time.

The directions for determining and treating the anomalies of *refraction and accommodation* are much too brief to serve as reliable guides in practice, but a good general idea of the subject may be obtained from them.

In the chapter on the *ophthalmoscope*, the normal appearances and pathological changes most frequently met with in the fundus of the eye are well described.

We have rarely seen so much important information condensed in so short a space as may be found in the "Ophthalmic Out-patient Practice," and medical men who have not the opportunity to observe that kind of practice for themselves will find here a remarkably clear and concise account of it. G. C. H.

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ART. XXXIV.—*On Diseases of the Abdomen, comprising those of the Stomach, and other parts of the Alimentary Canal, Œsophagus, Cæcum, Intestines, and Peritoneum.* By S. O. HABERSHON, M.D., London, Sen. Phys. to, and late Lecturer on the Principles and Practice of Medicine at Guy's Hospital, etc. With illustrations. Second American from the third enlarged and revised English edition. 8vo. pp. xv., 554. Philadelphia: Henry C. Lea, 1879.

THIS edition of Dr. Habershon's well-known work has been augmented by additional chapters on Diseases of the Tongue and Mouth, Diseases of the Pharynx, Peritonitis, Ascites, and Abdominal Tumours, and the number of illustrative cases has been increased from 163 to 192. As the first edition received an extended notice in the columns of this Journal for January, 1860, it is only requisite to refer to the changes which have been suggested by an additional experience of some twenty years.

The new chapter, on Diseases of the Tongue and Mouth, is a fragmentary summary, and offers nothing for special observation save some allusions to acute œdema of the tonsils, which we do not comprehend. The advice that the sooner an abscess in the tonsil is opened, the better, accords with our own observations, though objected to by many as imprudent and unnecessary; and mention is made in this connection that a protruding abscess may sometimes be opened by the pressure of a sharp finger-nail.

Chapter III., on Diseases of the Pharynx, is likewise a new one, and, while including a variety of subjects, is so carelessly phrased and paragraphed as to be somewhat confusing. Thus, the treatment of secondary syphilitic ulcerations of the throat, and the pathological anatomy and symptoms of ulceration in scrofulous and tuberculous subjects, are all cursorily mentioned in the same paragraph (p. 50). There is also a slight mention of diphtheria, the greater portion of which is given up to the paralytic sequelæ; and our author expresses his opinion

that diphtheria is essentially distinct from croup, in pathological character as well as in clinical history.

The chapter on Diseases of the Œsophagus, has been much enlarged and improved, and is quite systematic. It contains a great deal of valuable clinical material, illustrated by the records of thirty-one cases, comprising ulceration, perforation, functional dysphagia, spasm, syphilitic stricture, carcinoma—including a table of 74 cases, aneurism of the aorta, poisoning by deglutition of caustic substances, and rupture; and there is likewise a table of seventeen cases of gastrotomy for stricture, carcinoma, and malignant tumour, the longest prolongation of life having been forty days, and the next longest thirteen days.

In commenting upon the difficulty of determining the character of ulceration of the œsophagus, and the unsatisfactory character of its treatment, the remark is made: "It is painful to find, after death, that simple ulceration of the œsophagus, or a fistulous communication with the trachea, is the only existing disease; and that if food could have been introduced beyond this point, life might have been prolonged," and the serious consideration is suggested of the propriety of forming a gastric fistula in some of these cases (p. 59). In discussing the diagnosis of stricture, auscultation of the œsophagus is alluded to, but in terms leading to the inference that it has not been submitted to personal test. Extreme caution is urged in the use of bougies in the treatment of cancerous disease, though their serviceability is acknowledged at times, as a means of facilitating the introduction of nourishment into the stomach. The importance of resting the parts is illustrated by a very instructive record of a case in which, after a week's repose of the parts secured by the use of nutritive enemata, it became practicable to pass a bougie easily into the stomach, though impracticable previously, and the patient became able to take cod-liver oil and nourishing food, so that he quitted the hospital relieved. In concluding this chapter, attention is directed to *gastric solution* of the lower extremity of the œsophagus. The paucity of reliable information on diseases of the œsophagus renders this chapter exceedingly valuable.

In Chapter V., on Organic Diseases of the Stomach, dilatation, which was not discussed in the first edition, is illustrated by a table of 18 cases, chiefly from the post-mortem records of Guy's Hospital. The chief causes of this condition are stated as *obstruction*, *paralysis*, and the *paralysis of simple over-distension*. The peculiar form of the stomach, hollowness at the epigastrium, and a splashing sound on percussion, are indicated as the special diagnostic features. Kussmaul's treatment by washing out the organ is recommended as worthy of trial, and the importance of rest by the use of nutrient injections for a time, inculcated.

*Catarrh* of the stomach is described under the synonymous appellations of acute catarrhal gastritis, inflammatory dyspepsia, subacute inflammation. It is stated that there is a predisposition to this form of disease in strumous subjects, to be distinguished, however, from a sympathetic irritation of the stomach in the early stage of disease of the lungs and of the brain, and from a general condition of exhaustion towards the close of phthisis, closely simulating chronic gastritis, and implicating the intestines likewise. Alkalies, salines, and cold drinks, with sedatives to relieve the pain, are recommended in the treatment of acute catarrh, with avoidance of vegetable food, and the use of acid fruits. Leeches and blisters are mentioned as often of service, and likewise benefit from the introduction of a seton at the pit of the stomach.

In the remarks on ulceration of the stomach, we notice reference to a frequent association of hemorrhagic erosion with disease of the heart and lungs as shown by a list of fourteen cases tabulated from "Guy's Post-mortem Records." Chloric ether, with carbonate of sodium and mucilage mixture or almond emul-

sion, is mentioned as often of great service in relieving the pain of superficial ulceration, and rendering the stomach more tolerant of food.

The subject of perforating ulcer of the stomach is discussed in fuller detail, and a table is given of the seat, etc., in sixty-five cases from the post-mortem room of Guy's Hospital during the last twenty years. Dr. Brinton is prominently alluded to as an investigator in this branch of pathology, as well as other authors identified with the subject. It appears that the ulcer is much more frequent in females than in males (440:214, Brinton; 183:69, Lebert; 91:22, Bamberger); but the personal experience of the author, as far as it has gone, has shown the excess in males, 35:28, and he accounts for the discrepancy by the different sources whence the figures are obtained, believing it probable that some of the cases which did not reach the post-mortem room may have been gastralgia, subacute gastritis, or gastric catarrh. The usual symptoms of ulcer of the stomach and their differentiation from those of carcinoma are discussed with great clearness and precision. With regard to the occasional prolonged duration of life after the symptoms have been manifested, it is mentioned that in one case they were said to have extended over forty years. The subject of appropriate diet and medicine is carefully presented in a manner adapted to the exigencies of the usual contingencies.

Fibroid degeneration of the pylorus is carefully differentiated from carcinoma, and the latter subject, in its turn, receives an extended discussion, including a tabulated detail of 79 cases, chiefly from Guy's Hospital.

Chapter VII., on the Duodenum, is a very important one to the practitioner, as diseases of this portion of the alimentary canal are frequently mistaken for affections elsewhere. In the first edition it had been remarked that the statements as to ulcerations of the duodenum following burns had not been confirmed by certain observations made at Guy's Hospital, although a specimen of the kind existed in the museum; and it is now stated that since that former edition was written three cases of ulceration of the duodenum after burns have occurred at Guy's. These observations as to ulcers of stomach and duodenum only serve to prove how statistics from reliable sources may fail to be verified by individual series of observations, even when made under exceptionally favourable opportunities, and how important it is not to be carried too far in generalizing from one's own experience.

In Chapter X., on Diseases of the Cæcum and Appendix Cæci, unusual mobility of the cæcum, due to a long mesenteric attachment, is stated to be far from rare, and is considered of great pathological importance, as it allows the cæcum to pass into hernial sacs, and to change its position when there is intestinal obstruction or great distension from other causes. Three varieties of rotary motion, described by Rokitsansky, are discussed; rotation of the intestine upon its own axis, upon the mesentery as an axis, and upon another coil of intestine. The diverse characters of the appendix cæci are discussed at greater length. Atrophy of the intestine, a condition more common in advanced life, and in struma and phthisis, is shown to cause a globular or almost hernial bulging of the right side of the cæcum on account of its being but partially covered by the longitudinal bands, and the author has observed that by the contraction of a cicatrix, this sacculated portion has become almost shut off, so as to reduce the calibre of the passage from the ileum to the ascending colon, to about that of the ileum itself. Ulceration of the cæcum is stated to be rare as an independent disease, but frequent, when associated with other morbid conditions, as phthisis, enteric fever, and dysentery; and is often present from over stretching, as in obstruction of the sigmoid flexure, the mucous membrane yielding in transverse lines, as the skin does when ulcerating under similar over-stretching. The peritonitis which

ensues in typhlo-enteritis in the absence of adhesions, is described as almost as sudden in its symptoms, and as fatal in its results, as perforation of the stomach; but, as has been shown by M. Leudel, the accuracy of whose observations the author can fully affirm, extravasation is prevented by antecedent adhesions, in cases much more numerous than is generally supposed. In discussing the points of differential diagnosis, the author mentions prominently that he has known cases where the peritonitis from cæcal perforation was regarded at first as gall-stone, the sudden pain on the right side, with violent vomiting, closely simulating the symptoms of that disease. The indications of treatment are precise and expressed in positive terms, and caution is inculcated against attempts to leave the bed and use slight muscular effort when the pain has subsided, and the febrile excitement has disappeared, as they are exceedingly injudicious, and sometimes followed by a fatal result.

In the article on typhoid disease of the intestine, we notice an allusion to reduction of the pyrexia by the cautious use of cold water, in some cases of enteric fever, coupled with an injunction of great caution when there is evidence of severe intestinal affection, lest perforation be induced or fatal collapse ensue.

In Chapter XVI., on Organic Obstruction, Internal Strangulation, Intussusception, Carcinoma of Intestine, it is stated that of 7934 examinations recorded in the post-mortem rooms of Guy's Hospital during 23 years, twenty-five instances of fatal obstruction by bands are described. There were 114 cases of intestinal obstruction, including strictures of all kinds; 17 cases of intussusception; 8 of twisting of volvulus; 20 of adhesions and contractions. As regards the symptoms produced in these several conditions, it was found that those of internal strangulation and acute obstruction from twisting or compression differ from those due to intussusception, and from the more gradual disease due to cancerous growth; these three being taken as examples of the several varieties above enumerated.

Chapter XIX., on Peritonitis, is new, and discusses the pathological manifestations of acute peritonitis, chronic peritonitis, and peritonitis from cancerous disease with considerable detail, as well as their symptoms and diagnosis. The author has not found peritonitis to be an idiopathic disease. Out of 501 instances of peritonitis in 3752 inspections made at Guy's Hospital, he did not find a single case thoroughly recorded in which disease could be correctly regarded as existing solely in the serous membrane. Of these 501 cases, 261 were from direct extension of disease from adjoining viscera, direct injury, etc.; 94 were connected with blood changes in the course of albuminuria, pyæmia, puerperal fever, erysipelas, etc.; and 146 were connected with general or local perverted nutrition. Thirty-five of the first series of 261 cases were caused by injuries or operations directly affecting the serous membrane. Of these operations one was for removal of an ovarian cyst, one a case of gastrotomy, and fourteen were cases of paracentesis abdominis; five of the latter having been to relieve ascites accompanying cirrhosis, two for ascites with heart disease, and seven to empty large ovarian cysts. Our author remarks that in instances of ascites from heart disease, chronic bronchitis, and cirrhosis, the whole of the peritoneal capillaries are in a state of continued hyperæmia, and a very slight fresh exciting cause is sufficient to produce acute disease; and that if a large number of instances of paracentesis abdominis had been taken, it would have been found that in ovarian disease, especially of persons advanced in life, paracentesis is much less frequently followed by a severe and fatal result than in ascites following cirrhosis. Of the 501 cases of peritonitis, perforation occurred 56 times.

In the treatment of peritonitis, the consideration of its origin is deemed the best guide. Opium in full and repeated doses is regarded as of the greatest



value, not only in cases of perforation, but in cases of acute inflammation from extension of disease, while the injudicious attempt to relieve pain by purgatives, carminatives and stimulants may deprive the patient of the hope of recovery. The various other indications are lucidly presented, both as to what should be avoided and what should be employed.

The great value of this volume of Dr. Habershon resides in the fact that it is based upon copious and well studied personal observations, a large number of which are described with more or less detail, so that their salient points confirm the tenor of the text; and it could but rarely happen that a case of abdominal disorder, unfamiliar to the family practitioner, and even to a consultant in large practice, would not find an analogue in its carefully prepared pages. It is a book to be consulted with advantage in the study of individual cases of disease such as it portrays, and, as such, supplies the deficiencies inseparable from the scope of generalized treatises. The present edition is still more valuable than the first, containing additional information, and a number of important tables, as well as exhibiting conscientious revision of its previous material.

The typographical execution of the volume sustains the well-known reputation of the publisher.

J. S. C.

ART. XXXV.—*Report of Investigations into the Pathogeny of Diphtheria.*  
Conducted by EDWARD CURTIS, M.D., and THOMAS E. SATTERTHWAITE,  
M.D. 8vo. pp. 56.

THIS is a report, dated Feb. 11, 1877, to the Board of Health of the city of New York, from the honorary microscopist to the Board, Dr. Curtis, at whose request Dr. Satterthwaite was associated with him, in complying with a resolution desiring that he should investigate the causes and nature of diphtheria by means of micro-pathological examinations and otherwise. The report is presented in two parts. Part I. is a general report, and Part II. is a record of experiments.

The investigators took for their subject, *What is the nature of the infectious principle of diphtheria, and what are the circumstances that determine the infection?* Abundant evidence was found of the existence of the forms of bacteria described by other observers, "but these forms were in nowise different in optical or chemical behaviour from the bacteria found in putrescent but non-diphtheritic animal matters."

Experiments were made by inoculating rabbits with diphtheritic material, the animal being chosen partly from lack of facilities for dealing with larger or more troublesome animals, and partly because some German investigations, with which those under discussion were to be compared, had been conducted upon rabbits. Circumstances forced a termination to the investigations before a number of the projected points of inquiry had been sufficiently studied to draw conclusions from them. The results of the investigations made are summed up in nine propositions, not, however, put forth as proven. Condensing these propositions, it appears, 1, that although inoculation of diphtheritic membrane into the muscular tissue of the rabbit produces severe local lesions, and even constitutional disturbance and death, these effects differ too much in their pathology and clinical history from diphtheria in the human subject, to warrant defining them as diphtheria.

2. Similar effects can be produced by inoculation even of a material non-infectious to the human subject, under conditions where diphtheritic membrane is infectious—this material being pulpy scrapings of the upper surface of the healthy human tongue.

3. Effects generally similar, but less intense, can be produced even with Cohn's fluid (an aqueous solution of ammoniac tartrate, potassic and calcic phosphates, and magnesian sulphate), allowed to decompose spontaneously.

4. These effects are not due to simple mechanical irritation, for inoculations of sand produce no effect whatever.

5. Thorough filtration of a proven virulent aqueous infusion of diphtheritic membrane, or of putrid Cohn's fluid, removes their infectious properties.

6. Thorough trituration of proven virulent diphtheritic membrane and tongue-scrapings, with a high percentage of salicylic acid, fails to remove the intensity of the infectious quality of these substances, or even markedly to modify it.

7. There is no theoretical ground for assuming that preventing the bacteria of a diphtheritic patch from making their way through the underlying mucous membrane, will, in itself, prevent general diphtheritic infection of the system.

8. There is no relation between inoculable virulence of a diphtheritic membrane and the period, within three days, that has elapsed between the detachment of the membrane and inoculation with the same, nor between inoculable virulence and gross amount of bacteria present in the membrane. 'And

9. There is a rough relation between inoculable virulence of a diphtheritic membrane and the severity of the original case of diphtheria, so far as this can be estimated by the termination of the case in death or recovery.

Part II. comprises a record from 206 experiments, which form the basis of the above conclusions. These are divided into, 1, inoculations with diphtheritic matter; 2, inoculations of scrapings from the healthy human tongue; 3, inoculations of decomposed Cohn's solution; 4, inoculations of putrid infusions of calf's liver; 5, inoculations of sand; 6, inoculations of salicylic acid; 7, inoculations of salicylic acid and vaccine virus; and 8, experiments to test the power of salicylic acid to prevent the development of bacteria in putrescible fluids.

In looking over these records, numbers of which are presented in detail, and others in a more or less general manner, we became aware of the conscientious performance of a great amount of varied labour. Thus, the inoculations with diphtheritic matter were made with pure membrane, with its aqueous infusion, cold and boiled, filtered and putrid, with the reddened mucous membrane of the trachea, kidney-tissue, and with a mixture of pure membrane and salicylic acid; and these, with the other materials employed, were also varied in somewhat similar manner. A great many microscopic examinations were made of the products at the site of the inoculations, and of various organs after death.

Much as the ingenuity and pertinacity of these experiments may be appreciated, it is questionable whether anything has been learned in solution of the inquiry as to the causes and nature of diphtheria. Inoculations of the cornea of the rabbit failed, in the hands of Drs. Curtis and Satterthwaite, to produce extensive diphtheritic keratitis with constitutional symptoms, and even termination in death, as announced by Eberth. Nothing resulted but small local spots of inflammation at the site of each puncture, which appeared the day after infection, and, speedily subsiding, left the eye well by the fourth or sixth day. Hence, subsequent inoculations were made into the muscular, or into the subcutaneous connective tissues; and the results confirmed those of other investigators in producing poisonous effects, fatal in the majority of instances. These effects, however, were deemed manifestations of local irritant poisoning, and not evidences of diphtheria, for similar results followed inoculation with scrapings from the upper surface of a somewhat furred tongue in the healthy subject, and to a less extent with inoculations of putrescent Cohn's solution.

To offer a fair prospect of success, experiments with diphtheritic products and other presumed sources of contagion, should be made upon animals known or

suspected to be susceptible to diphtheria, as contended for by some veterinary surgeons. Rabbits, evidently, are not good subjects for the infection of diphtheria.

The negative value of the investigations under consideration, as far as they go, is incontestible, and their record is presented in a straightforward manner that commends the little pamphlet to the study of those inclined to continue the same field of inquiry.

J. S. C.

ART. XXXVI. — *Notes on Rheumatism.* By JULIUS POLLOCK, M.D., F.R.C.P., Senior Physician and Lecturer on Medicine, Charing Cross Hospital, etc. 12mo. pp. 115. London: J. & A. Churchill, 1879.

“THE Treatment of Acute Articular Rheumatism by the Salicylate of Soda, with Notes of Cases,” would be a more appropriate title for this little essay than the one it bears; but the author was probably deterred from adopting it by the fact that it has lost somewhat of the appearance of originality. The three chapters, extending over seventy-two pages, on muscular rheumatism, have been interpolated apparently solely with the object of justifying the more comprehensive title, but being foreign to the general tenor of the article, they had better have been omitted, especially since they add nothing to existing knowledge on the subject. Moreover, the term muscular rheumatism, as generally applied and used in this book, is a misnomer; it has nothing in common with true rheumatism; it is not an active inflammation, is not attended by fever, does not run a definite course, and has no tendency to heart complication. If further proof of its distinct nature were needed, it is found in the general opinion of observers that it is certainly not relieved by salicylate of soda, which exerts almost a specific influence over rheumatism. While its pathology is obscure, it is evidently a local and not a general disease. Its etiology is closely connected with muscular mal-nutrition and an abnormal condition of certain muscular fibrillæ or sarcous elements, and is favoured by causes that depress the system, aided by local strain, fatigue, or exposure to dampness and cold. The term myalgia, proposed by Inman, is now coming into general use, to express this condition, in which pain is produced in a muscle obliged to work when its structure is imperfectly nourished, or impaired by disease (Anstie); and while possessing the negative merit of not expressing any opinion as to the pathology of the morbid state, at the same time it is free from the positive objection of grouping under a common title diseases essentially different. It is not intended, however, to deny the existence of transitory pains around the joints, and stiffness or contracture of tendons which are often encountered in rheumatic subjects, and which are also unaccompanied by fever, and may occur simultaneously in several different portions of the body. These are accompanied by signs of the rheumatic diathesis, and are benefited by alkalies and a non-nitrogenized diet. Myalgia, on the contrary, is located permanently in certain muscles, which are tender to the touch and are subject to painful spasm; it is not connected with a special diathesis, and is caused by overwork and under-feeding, with accidents of exposure to cold. It is to be treated by rest, anodyne applications, tonics, and nitrogenized food; and in the way of prophylaxis we should remember that, as mentioned by our author, “to avoid muscular rheumatism, we must shun those things that produce it,” such as cold and damp, straining, overwork, and dyspepsia.

The experience of Dr. Pollock leads him to fully indorse the salicylate of soda treatment of articular rheumatism, and the clinical notes of sixteen cases thus treated are given in the appendix.

F. W.

ART. XXVII.—*A Treatise on the Diseases of Infancy and Childhood.* By J. LEWIS SMITH, M.D., Clinical Prof. of Diseases of Children in Bellevue Hospital Medical College, etc. Fourth edition. Thoroughly revised. 8vo. pp. 758. Philadelphia: Henry C. Lea, 1879.

THE high appreciation in which this excellent work is held by the profession is best attested by the fact that on the completion of its first decade it has reached a fourth edition, and it only remains for us to add that the revision which it has just undergone brings its teachings fully abreast the latest advances of medical knowledge.

We notice marked evidences of revision in the chapters on scarlatina and on diphtheria. Dr. Smith holds that the natural course of scarlatina cannot be shortened or aborted by treatment, and that carbolic acid, salicylic acid, or any other known remedy cannot be safely used in sufficiently large doses to antagonize the specific poison in the system. He is also an uncompromising believer in the constitutional character of diphtheria, and thinks that incalculable mischief has been done by the teachings of Oertel as to the local infectious origin of this disease. He earnestly advocates constitutional treatment from the beginning as of paramount importance, and holds that the indications are, as in scarlet fever, to sustain the patient by the most nutritious diet, by tonics, and a liberal use of stimulants, and to employ other measures, general and local, as adjuvants to meet special indications which may arise.

In the treatment of intussusception, "when pressure from below by water, air, or gas, which is the only efficient mode of treatment short of the knife, has been tried sufficiently long and often without result," Dr. Smith urges that surgical advice in reference to laparotomy, be sought, and adds that "laparotomy performed on the first or second day will be much more likely to save life in ordinary cases than if performed later, since the strangulated intestine is soon badly damaged, and a local peritonitis is apt to be developed any time after the first forty-eight hours."

Dr. Smith has written such an excellent treatise that we cannot but wish that in his next edition he would supply a deficiency conspicuous in all our text-books on diseases of children—a complete chapter on infant diet in health and disease. The importance of this subject is universally recognized, yet, strange to say, there is no systematic work, so far as we know, with perhaps the single exception of Eustace Smith on *Wasting Diseases of Children*, in which the subject is at all fully treated.

I. M. H.

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ART. XXXVIII.—*Trattato Pratico delle Malattie delle Donne*, per T. GAILLARD THOMAS, Dottore in Medicina, Professore di Ostetrica e Malattie delle Donne e dei Brambini nel Collegio dei Medici e Chirurghi di Nuova York, etc. etc. . . . *Versione Italiana Dall' originale Inglese*, dei Dottori L. GIUNTOLI e P. BOTTONI. Con 191 figure intercalate nel testo. Prima edizione. 8vo. pp. 870. Firenze. Tipografia di Eduardo Ducci, 1877.

*A Practical Treatise upon the Diseases of Women*, by T. GAILLARD THOMAS, M.D., Professor of Obstetrics and Diseases of Women and Children in the College of Physicians and Surgeons of New York, etc. etc. *Italian Translation from the original English*, by Doctors L. GIUNTOLI and P. BOTTONI.

THIS large octavo volume of 870 pages pays quite a handsome compliment to the recently-elected President of the American Gynecological Society, and author

of the work of which it is a translation. Like the contributions to medical science of their own distinguished Professor of Bologna, Francesco Rizzoli, the volume by Dr. Thomas derives much of its value from his own extensive experience, so much made use of in its preparation. Appreciating this, the translators say at different points of their preface: The work of Professor Thomas, in all its relations, leaves nothing to desire. It is particularly preferable to other works of the same kind by reason of the eminently practical spirit which pervades it. . . . "We believe that it will contribute effectively to the advancement of gynæcology in Italy." The translation is dedicated to "The Illustrious Professor Pietro Cipriani, President, and Teacher of Clinical Medicine in the School of Florence, and Senator and Chief Physician of the Kingdom."

The translators of Dr. Thomas's work have confined themselves almost entirely to the reproduction of the text in their own tongue; but there are a few explanatory foot-notes, one of which is an amusing interpretation of the expression, "our *Milesian* population"—"*la nostra popolazione Milesia*." "It applies to that population which is found *scattered* through North America, and which originating in Ireland, has preserved the customs, religion, etc. of the country from which they originated. They are called in America, *Milesian*." Page 23. Considering that the term is not found in any of the leading dictionaries in the English language, it is more remarkable that the translators should have known that it applied to the Celtic Irish, than that they should have thought this population was *sparsely* distributed among us, where they abound in every large town across the continent.

The reproduction of so large a work in Italy is another of the many evidences of the high appreciation in which the labours of American gynæcologists are held abroad.

R. P. H.

ART. XXXIX.—*A Treatise on Therapeutics, comprising Materia Medica and Toxicology, with especial reference to the Application of the Physiological Action of Drugs to Clinical Medicine.* By H. C. WOOD, Jr., M.D., Professor of Materia Medica and Therapeutics in the University of Pennsylvania. Third edition, revised and enlarged. 8vo. pp. 720. Philadelphia: J. B. Lippincott & Co., 1879.

IN the present edition of this well-known and justly-esteemed work, no very essential changes are to be observed, but a few articles, especially those upon salicylic acid and jaborandi, have been rewritten to correspond with the most recent inquiries upon these subjects, and a few others, mostly upon drugs of comparatively slight importance, have been added. We may notice the same thoroughness of research into the literature of therapeutics which has marked former editions, as well as the ability with which the results are utilized.

As a teacher of therapeutics, the writer cannot help wishing that a "student's edition" of this work might be prepared, in which the various authorities, so confusing to the student, especially when arrayed, as science so often demands, on opposite sides of some question, might be "boiled down," and, so far as may be, harmonized by a competent hand, best of all, the author's.

If the beginner is to get any clear notions of experimental therapeutics whatever, and especially if he is to trust his memory for them after being once acquired, a little scientific nicety must sometimes be sacrificed in his behalf in favour of clearness and decision of statement.

R. T. E.

ART. XL.—*A Guide to Therapeutics and Materia Medica.* By ROBERT FARQUHARSON, M.D. Edin., Lecturer on Materia Medica at St. Mary's Hospital Medical School. 2d American edition. Revised by the Author. *Enlarged and adapted to the United States Pharmacopœia*, by FRANK WOODBURY, M.D. 12mo. pp. 498. Philadelphia: Henry C. Lea, 1879.

FEW authors receive so great a compliment as the call for a second edition within eighteen months from the first appearance of their work, and while the most popular books are not necessarily the best, in the case before us, to a great extent owing to the energy and skill of its American editor, its merit keeps pace with its popularity.

This issue, though containing nearly a hundred pages more than its predecessor, through the substitution of thinner paper, shows very little increase in bulk. The numerous additions, which are contributed both by the author and editor, rectify the faults of omission in the previous edition, and add largely to the value and general usefulness of the work. We notice, however, that many of the erroneous doses and proportions given in the first edition still remain uncorrected.

R. M. S.

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ART. XLI.—*Essays in Surgical Anatomy and Surgery.* By JOHN A. WYETH, M.D. 8vo. pp. 262. New York: Wm. Wood & Co., 1879.

THIS volume contains five papers: The surgical anatomy and history of the carotid arteries, of the innominate and subclavian arteries, the surgical anatomy of the tibio-tarsal region, of the obturator artery, and notes on the surgical anatomy of the hip joint. The first three are the most important essays, and were presented in competition for prizes offered by the American Medical Association and the Alumni Association of Bellevue College. The fact that they were successful in obtaining these prizes attests their merit.

It is always a mistake to affix to a book a title that gives no indication of its contents, hence it would have been better if the author had named his production "The Surgical Anatomy of the Great Vessels of the Neck;" since 246 pages of the 262 are devoted to the anatomy and surgery of the carotid, subclavian, and innominate arteries.

The great amount of original investigation and research that has been given to the work is evident when it is stated that the position of origin of the eight branches of the external carotid artery was accurately measured in 121 dissections; and that tables of ligations of the great vessels of the neck were compiled from every available source. In the case of the common carotid the number of operations tabulated is 789. From these dissections and statistical tables elaborate deductions have been formulated regarding the proper point of ligation in various surgical conditions. Excellent illustrations show the average variation of origin of the branches, the relations of the veins, and the proper point for ligating the trunk. The discussion of the innominate and subclavian arteries is conducted in a similar way. The last three essays are excellent, but they are thrown into strong shadow by the brilliancy of their associates; the one on the anatomy of the tibio-tarsal region appeared originally in this Journal (1876).

The author's conclusions are so important and based on such good evidence, that it may be well to mention at least some of them. The most astonishing of

his results is the comparative mortality following ligation of the common and external carotid arteries. While 41 per cent. of the cases operated upon die after ligation of the common trunk, only  $4\frac{1}{2}$  per cent. prove fatal after tying the external carotid; hence "the common carotid should never be tied for a lesion of the external carotid, or its branches, when there is room enough between the lesion and the bifurcation of the primitive carotid to permit the ligation of the external." When discussing the method of tying the external vessel he says that the ligature in the majority of cases may be applied in one of two positions, viz.: between the origins of the superior thyroid and lingual, about one-quarter inch above the bifurcation, or between the facial and posterior auricular about one inch and a half above the thyroid cartilage. When discussing the internal carotid artery the author says that in all intra-cranial lesions involving alone the internal carotid or its branches, this vessel should be tied first; and if the treatment does not prove successful, the external carotid is then to be ligated at the crossing of the digastric muscle. When it is found that the facial is given off below this point it is necessary to secure it also, because of the intimate anastomosis between its terminal branches and the intracranial branches of the internal carotid. In cases of wounds of the internal carotid in the neck it should be ligated above and below the lesion in every instance, since secondary hemorrhage is liable to occur from the descending current by means of the circle of Willis.

From what has been said it is apparent that the volume contains much of great value to the surgeon, and that it will repay one who opens it for perusal, because the deductions are derived from careful and accurate dissections and intelligent study of a very large number of cases.

J. B. R.

ART. XLII.—*Atlas of Skin Diseases*. By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in Hospital of University of Pennsylvania; Physician to Dispensary for Skin Diseases, Philadelphia; Dermatologist to Philadelphia Hospital, etc. Part V. Philadelphia: J. B. Lippincott & Co., 1879.

THIS part contains portraits of scabies, herpes zoster, tinea sycosis, and eczema (vesiculosum); portraits executed with the same literal faithfulness, and of the same artistic merit, which have characterized the preceding numbers. The first of the series, representing an aggravated case of itch, reproduces as successfully as possible the minute and typical lesion of this affection, the burrow of the female parasite, as well as the gravest secondary forms of eruption. To the younger class of physicians, who no longer have opportunity of making themselves familiar with the appearances of this fluctuating disease, this plate will be of especial service in the diagnosis of suspected cases. The second illustration is a very good one of thoracic shingles. The third is a most excellent and long needed picture of parasitic sycosis, the only coloured and satisfactory representation of the affection ever published. So much confusion prevails in respect to the differential diagnosis between it, the non-parasitic form, and eczema of the bearded face, that the appearance of this plate is of especial importance in dermatology. The fourth is a representation of vesicular eczema, one of the rarest forms of this common malady. In a hundred cases of the disease, as they present themselves at a clinic, opportunities of showing this, the typical lesion of Willan's school, are very infrequent, excepting the dermatitis be of extraneous origin. The text accompanying the atlas presents, as before, a simple, brief, and clear description of the disease, and of the case illustrated.

J. C. W.

ART. XLIII.—*Habitual Drunkenness, and Insane Drunkards.* By JOHN CHARLES BUCKNILL, M.D., Lond., F.R.S.; Late Lord Chancellor's Visitor of Lunatics. 16mo. pp. xxx., 103. London: Macmillan & Co., 1878.

ATTEMPTS have been recently made in Great Britain to induce Parliament to pass an act providing for compulsory confinement and detention, with a view to curative treatment, in the cases of persons who might be adjudged "habitual drunkards." Of course this implies assent to, or tolerance of, the proposition that the condition is one of disease rather than of depravity.

Our readers are well aware that many members of the profession, taking a broad view of all the antecedents, conditions, and circumstances, connected with habitual inebriety, have been disposed to think, that, oftentimes, the victim is to be pitied for his unhealthy organization, as much as, or more than, blamed, for his vicious propensity. Some attach more weight, and some less, to the possible agency of hereditary influence, nourishment (or the want of it), labour, recreations, etc. They do not necessarily look upon every drunkard as absolutely, or even possibly, insane. When, however, they find in vital or ancestral antecedents, causes *which are known to produce insanity, or epilepsy, or general nervous debility, or habitual resort to the nepenthe of alcohol*, they do not perceive that they are offending against good sense, nor yet good morals, by using the words "disease" and "diseased," in speaking of the state and the man. Very naturally, therefore, they have found nothing, *à priori*, absurd or improper in the idea of having asylums or hospitals aiming at the "cure" of such persons.

Not so, however, thinks Dr. Bucknill. Both idea and act, principle and execution, meet his most emphatic dissent. To be sure, he admits in a general way that drunken habits may sometimes be a symptom or result of insanity; but maintains that other proofs of unsoundness may always be detected; and that, moreover, such cases are incurable. We are not always quite able to reconcile the doctor's different utterances. It seems sometimes as if he assented to the "disease theory," in the abstract, while ignoring it in the concrete. His oftenest reiterated creed, however, is that habitual drunkenness is a vice, to be punished, and if possible, reformed; not a malady to be commiserated and cured.

Just how much Dr. Bucknill's observations in this country had to do with his present views we cannot exactly determine. He frankly admits, however, that his impressions of inebriate asylums, as here existent, were anything but favourable. Bad management, insincerity, deception, misrepresentation of results, lack of any regular treatment, and general hollowness, are, in effect, the accusations which his judgment forces him to bring against some of those which he visited. In a few cases he found the asylums abandoned, or diverted to different purposes. Elsewhere, where no suspicion might attach to the entire honesty and good intentions of the management, there was a manifest want of common sense, and knowledge of human nature—especially as affected by drink—and, to put it plainly, a somewhat strong infusion of cant. In one or two exceptional instances, where he found reason to believe that reformation was earnestly laboured for, and partially, at least, with success, it was in establishments professedly religious and reformatory—not medical or curative.

Perhaps it will not be altogether surprising to those of us who have noticed the history of American Inebriate Asylums, that our distinguished visitor should have been both disappointed and disgusted with some chapters in their history.

One of the doctor's objections to the proposed legislation is that in practice it would result in the wealthier inebriates being considered as unfortunate sick men, while their poorer brethren would continue to suffer sentences as law-breakers.



If, however, it were proposed to establish curative asylums for the poor, at State cost, the great number requiring treatment would constitute a perfectly intolerable burden on the temperate rate-payers. Moreover, many men would be confined, who, in spite of their bad habits, are the support of their families. And confinement for months or even years, was contemplated by the proposed legislation.

Whether any efficient means have been or will be devised for the reformation (or cure) of inebriety, outside of such influences as hygiene, good food, wholesome apartments, education, innocent recreation, etc., we very much doubt. As to such legislation as is opposed by our author, we cannot but agree with him that it is crude, unwise, and worse than useless.

We believe that Dr. Bucknill is right in opposing the universal confinement of drunkards as victims of disease. But we as surely believe that excessive use of stimulants is not unfrequently a manifestation—sometimes the only one—of disease. Cases are to be viewed and treated individually. As to the alleged injustice in giving to the rich privileges denied to the poor, by allowing pay hospitals without establishing free ones, we can only say that wealth always has commanded and always will command more of ease and luxury and opportunity than poverty can expect to attain. We do not know why those able to pay should not command whatever means of cure or reformation may seem to them to promise help. We cannot see why the State should, therefore, be under obligation to provide like means for the less fortunate classes.

As to the expediency of any special laws providing for the enforced confinement of any class of drunkards, we are much disposed to agree with Dr. Bucknill in deeming them unwise. We also agree with him in considering drunkards as unfit and harmful inmates for insane hospitals. Then, is it not right and proper to allow of institutions expressly designed for persons able and willing to become patients voluntarily, whether the attempted change be termed a "reformation" or a "cure"?  
B. L. R.

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ART. XLIV.—*A Guide to the Qualitative and Quantitative Analysis of the Urine; designed for Physicians, Chemists, and Pharmacists.* By Dr. C. NEUBAUER and J. VOGEL, with a preface by Prof. D. R. FRESENIUS. Translated from the seventh enlarged and revised German edition by ELBRIDGE G. CUTLER, M.D., Pathologist at the Boston City Hospital, etc. Revised by EDWARD S. WOOD, M.D., Prof. of Chemistry in the Medical School of Harvard University. 8vo. pp. xxiv., 551. New York: Wm. Wood & Co., 1879.

WITH regard to so well known a work, it is only necessary to say that a new English edition is now issued after the lapse of many years. The Sydenham Society's edition, translated by Markham, appeared in 1863. Since then so many editions of the original work have been issued, that the Sydenham has long since failed to represent the book in its more modern German dress.

Being by far the most complete and exhaustive treatise on the subject, it is absolutely indispensable to every working urologist. The latter is therefore under no slight obligation to the translator; for even the tolerably fluent reader of German will admit there is a vast saving of time in the reading of a book in one's mother tongue. Even a greater service is rendered to the much larger number of English readers to whom the book is now opened for the first time, and we predict for it a success which will be commensurate with the labour and expense of its preparation.  
J. T.

# QUARTERLY SUMMARY

OF THE

## IMPROVEMENTS AND DISCOVERIES

IN THE

### MEDICAL SCIENCES.

#### ANATOMY AND PHYSIOLOGY.

##### *Case of Total Absence of the Spleen.*

The following curious fact is related by KOCH and WACHSMUTH in the *Berliner Klinische Wochenschrift*, February 10, 1879. On the 6th of December, 1878, in the hospital of Altona, there died a large, strongly-built, muscular plumber, who had been received two days before with his son, a lad aged 15, who was ill with typhoid fever. The father was feeling very unwell; his temperature was very high. He had profuse diarrhœa, together with a few rose-coloured spots, suggesting the probability of the same affection from which his son was suffering, especially as he had been nursing him. The spleen, however, could neither be palpated nor percussed, and the examination of the patient revealed only bronchopneumonia of the right side of the chest. At the necropsy, this latter diagnosis having been confirmed, the authors proceeded to examine the spleen, which, to their great astonishment, they could not find anywhere. All the intestines were perfectly normal, as to their size and situation, but there was neither a spleen nor a vessel corresponding to the arteria splenica.—*London Med. Record*, May 15, 1879.

##### *Case of Obliteration of Vena Cava Inferior, with great Stenosis of Orifices of Hepatic Veins.*

Dr. WILLIAM OSLER, Prof. of Institutes of Medicine in M'Gill University, Montreal, reports (*Journal of Anat. and Phys.*, April, 1879) a case of obliteration of the inferior vena cava, in which the obliteration can neither be traced to compression nor to the extension of a thrombus, and which had probably lasted some years, the vein being converted into a firm fibrous cord; and the hepatic veins, where they enter the cava, are so far involved as to be reduced to the condition of insignificant orifices. The collateral circulation was carried on chiefly by the azygos vein, which also provided accommodation for a considerable proportion of the blood of the portal system.

The absence from the clinical history of the case of any acute illness which may be supposed to correspond to the date of occlusion, and the general backwardness of nutrition which was observed, favours the view of the obliteration being congenital, but there is nothing else to support it. Whatever may have

been the primary cause of the obliteration, it must have led to the formation of a thrombus, the final transformation of which is represented by the cord-like structure mentioned above.

The clinical history of the case and the notes of the post-mortem examination are minutely given.

### *Physiological Albuminuria.*

Dr. MARCACCII, in a communication to the Medical Society of Florence on May 12, 1878, and reported lately in *L'Imparziale*, observes that the presence of albumen in the urine is considered by the majority of physicians as the index of a pathological condition, although Bernard, Vogel, Hoffman, and others, have pointed out that albuminuria may be met with in men whose health is perfect, and under certain conditions of alimentation. The excessive consumption of eggs is only one of the conditions of this sort of physiological albuminuria. It is somewhat difficult to prove that the presence of albumen is not related either to a morbid state or to a special *régime*. Moreover, there exists a certain number of cases of error. In these researches, it is only with small quantities of albumen that one deals, while the blood, pus, and the urethral mucus, or that of the other neighbouring organs or prostatic fluid, may in themselves constitute a cause of error when they are mixed with the urine. Nevertheless, according to M. Marcacci, a series of observations made upon himself has proved to him that albumen may be found in a physiological urine. Albumen, he says, is constantly absent in nocturnal urine; on the contrary, it is very rarely absent in diurnal urine; it is possible to make albumen appear in the diurnal urine by executing rotatory movements of the arm for from ten to fifteen minutes in such fashion as the pulse is raised from seventy-five to one hundred and fifteen pulsations a minute. These results are in some sort confirmatory of the researches made by Leube at Erlangen in 1877, which are worth while summarizing. Leube undertook his research on the soldiers of the garrison at Erlangen, and took the necessary precautions to avoid blenorragia. The following was his method of research. Fresh urine was filtered, and a certain quantity carried to the boiling point; the other was treated by nitric acid, both being compared with the intact urine on a block tablet. In the urine which showed opacity, a small quantity of acetic acid was added to precipitate the deposit. This precipitate was washed and treated by Millon's fluid, and another test was made with the liquor potassæ, and possibly with the sulphate of copper and heat, when the purple red or violet colour was obtained with Millon's fluid, or the violet colour with the potassa, the urine was considered as albuminous. Leube examined the night urine of 119 soldiers. The number of observations was 154, which were thus divided: 90 soldiers were examined once, 23 were examined twice on two different days, and 6 were examined three times at intervals of three days. Briefly, out of 154 examples of nocturnal urine, only a very small quantity of albumen was found in five cases, and in only one case a notable proportion. Researches performed on the urine secreted during the day after military exercise, and in the months of June, July, and August, gave very different results; in fact, of five soldiers who had shown albumen in the night urine, a much larger quantity was found in the day, and further, albumen was found in eighteen soldiers who had not presented any in the night. Bringing the frequency of albumen in these observations to a percentage, it was found that the morning urine was albuminous in 5 soldiers out of 119, that is to say, in 4.2 per cent.; that of the middle of the day was albuminous in 19 soldiers out of the 119, that is to say, in 16 per cent. The day urine was only albuminous in 14 soldiers out of 119, that is to say, 11.8 per cent. Finally, the urine of the morning and that of the middle of the day were equally

albuminous in 5 soldiers out of 119, that is to say, in 4.2 per cent. It may be added, that the quantity of albumen in the urine most heavily loaded with that substance was from 37 to 38 milligrammes per cent. Such are the facts which seem to prove the possibility of albuminuria in the physiological state.—*British Med. Journal*, May 10, 1879.

### *Estimation of Sugar in the Urine.*

A series of observations to determine the relative value of the more delicate methods of ascertaining the quantity of sugar in urine have been undertaken by Hagen and Müller. The object was especially to ascertain whether any other method was more reliable than that with Fehling's solution, which possesses the grave disadvantage that with very small quantities of sugar the oxide of copper which is formed is not precipitated. Where it can be employed, Fehling's method is considerably more accurate than estimation by polarization—some .3 to .4 per cent. For comparison with Fehling's solution they employed the reduction process of Knapp, in which a solution of mercury cyanide is used, which is decomposed on boiling with grape sugar, metallic mercury being precipitated. Their experience is that this method is thoroughly available for urinary analysis.

Their investigations were directed especially to the settlement of four questions: 1. Do the two methods give the same result? A series of twenty-six estimations of diabetic urine by each method showed that both methods agree. Pillitz arrived at the same conclusion. Hoppe Seyler thought Knapp's method much less accurate than that of Fehling. 2. Can Knapp's method be employed when Fehling's gives no result? According to these experiments, Fehling's method ceases to be available when the quantity of sugar is below .7 per cent. Knapp's method, however, could be employed down to .1 per cent. of sugar. It is true that so small a quantity of sugar can only be estimated with the greatest care. Every specimen of urine contains, in greater or less quantity, substances capable of causing reduction, and which act on the solution of both Fehling and Knapp just as sugar does. 3. Which of the two methods is to be preferred? Knapp's method is available in all cases, Fehling's only in a limited number. Knapp's solution can be prepared quickly and easily, can be kept without alteration, and can be employed for the estimation of sugar more rapidly than Fehling's. On these grounds they prefer Knapp's method. Of course, both it and Fehling's only show the quantity of reducing substance in the urine. 4. The estimation of sugar in albuminous urines. It is commonly assumed that the albumen must first be separated from the urine. It was shown that albumen hinders the precipitation of both mercury and copper, since the precipitate remains partly in solution and partly suspended. This action is not, however, distinct unless the albumen is more than .2 per cent., and if less than this the sugar may be estimated without preceding separation of albumen. This was demonstrated by a series of double estimations with and without the separation of the albumen. Lastly, the question is discussed how far it is justifiable to regard reducing power and sugar as correspondent. In urine which is free from sugar .087 to .37 per cent. of apparent sugar may be discovered, and this amount of error must evidently occur in every estimate of sugar in diabetic urine. It is urged that recent examinations of the blood all incur the same error, and, however accurately the oxide of copper may be estimated, this source of uncertainty remains. Lehmann's older observations were free from this source of error; from muscle, brain, and lungs, extracts were obtained which reduced abundantly, but contained no sugar.—*Lancet*, April 26, 1879.

## MATERIA MEDICA AND THERAPEUTICS.

*The Therapeutic Value of Croton Chloral.*

In a very interesting paper read before the Ulster Medical Society Dr. RIDDELL (*Dublin Medical Journal*, April, 1879) reports his experiences of the great therapeutical value of croton (butyl) chloral. He mentions a case of severe paroxysmal headache ineffectually treated for many years by all the usual remedies of the *Pharmacopæia*, but cured by five grains of butyl-chloral twice daily and ten grains taken at night dissolved in spirits of wine and glycerine, with a little acid and syrup of orange to cover the flavour. The patient continues the five-grain doses at night and now enjoys better health than she has done for years. Since that case, Dr. Riddell says he has used it largely—sometimes failing, sometimes relieving—till, by keeping an account of all his cases, it began to be clear which were most benefited by the drug. Since then the number of cases relieved (some permanently) has increased. These cases are: headache in females arising from mental distress; those cases of headache frequent at the menopause—in fact, all those called neuralgic, except a few arising from internal mischief, are benefited, and in many instances cured. In that distressing species of neuralgia called *tic douloureux*, he has found it in many cases acting like a charm. Of course he does not include any arising from cranial or intracranial causes. He has tried it in neuralgia of the ovaries, but no good resulted. In insomnia, it is not so reliable as the hydrate: but in some cases, where the loss of, or inability to, sleep is accompanied by a weak or fatty heart, it is to be preferred, as it has no weakening effect on the central organ of the circulation. In one case of delirium tremens, where the circulation was very feeble, the combination of croton-chloral with digitalis had a wonderful effect, and it seemed as if the drugs could be given together in much smaller doses to produce the same results than singly. In this case he pushed it from ten to thirty grains every three hours, with drachm and two-drachm doses of the infusion of digitalis. In pain arising from caries of teeth, he has found it useless in most cases, and in all inferior to Richardson's "tinctura gelsemini"; but in one case, of a nervous young lady, by giving her two ten-grain doses, he was able to extract a tooth next to painlessly, to her great satisfaction. It is in affections of those parts supplied by the fifth pair of nerves that it is of most use; but, to be of service, the drug must be given in far larger doses than prescribed in the *Pharmacopæia* for adults, five grains three or four times daily, gradually increasing if required; if stimulants be wanted, dissolve it in rectified spirit; if not, dissolve it in glycerine. In all cases complicated with hemorrhoids, give glycerine. If anæmia exist, combine it with iron, or, what he believes better, arsenic; then gradually lessen the chloral. In all cases he has found it better to give it in solution than in powder or pill. Dr. Riddell mentions also severe pain with photophobia and blepharospasm after injury, in which atropia failed, but ten grains of butyl-chloral repeated in an hour gave complete relief; and a case of acute painful facial carbuncle, in which the effect of ten-grain doses every three hours was "simply marvellous," the disease going through its frequent stages almost without the patient knowing anything of the matter from the sense of feeling.—*British Med. Journal*, May 3, 1879.

*Defibrinated Blood for Rectal Alimentation.*

At a late meeting of the Therapeutical Society of New York, Dr. ANDREW H. SMITH, Chairman of the Committee on Restoratives, presented a report (*New*

*York Medical Journal*, April, 1879) on this subject. From the facts before them the committee felt warranted in drawing the following conclusions:—

1. That defibrinated blood is admirably adapted for use for rectal alimentation.

2. That in doses of two to six ounces it is usually retained without any inconvenience, and is frequently so completely absorbed that very little trace of it can be discovered in the dejections.

3. That administered in this way once or twice a day, it produces in about one-third of the cases for the first few days more or less constipation of the bowels.

4. That in a small proportion of cases the constipation persists, and even becomes more decided the longer the enemata are continued.

5. That in a small percentage of cases irritability of the bowels attends its protracted use.

6. That it is a valuable aid to the stomach whenever the latter is inadequate to a complete nutrition of the system.

7. That its use is indicated in all cases not involving the large intestine, and requiring a tonic influence which cannot readily be obtained by remedies employed in the usual way.

8. That in favourable cases it is capable of giving an impulse to nutrition which is rarely if ever obtained from the employment of other remedies.

9. That its use is wholly unattended by danger.

#### *On the Use of Ether with Cod-liver Oil.*

The same committee (*Ibid.*), from an investigation of the evidence before them felt warranted in drawing the following conclusions:—

1. That the addition of ether to cod-liver oil in about the proportion of fifteen minims to each half ounce (or an equivalent amount of the compound spirit of ether) will succeed in the vast majority of cases in enabling the patient to take the oil, even though it previously disagreed.

2. That in some cases in which the oil still disagrees after the addition of the ether, the difficulty may be overcome by giving the ether separately from fifteen minutes to half an hour after the oil is taken.

No facts have been laid before the committee having a bearing upon the question as to whether the etherized oil is superior to the plain oil in its ultimate effect upon nutrition, supposing them to be equally well tolerated by the stomach.

#### *Diuretic Action of Squill.*

M. DROUOT has studied (*Thèse de Nancy*, 1878) the action of squill on the organism, and particularly on the heart, from a large number of experiments made on animals, and from clinical observations, and has inferred therefrom what the therapeutic consequences of the action will be. In a short historical sketch he shows that there are two principal categories of opinions on the action of squill; one of which maintains that it is a powerful diuretic, and the other, which represents the majority, holds that squill does not exercise any special effect on the kidneys, and only influences the urinary secretion indirectly, by acting upon the heart in a similar way to digitalis. M. Drouot is a warm advocate of the latter opinion, and bases his views on a scientific explanation. The first part of the thesis (*Rev. Méd. de l'Est*, Feb. 15, 1879) contains an account of the author's experiments on dogs and frogs, relating to the action of squill on the heart and circulation. Some of his results confirm the experiments made by Huzemann of Göttingen, while others oppose them. If squill is given in a moderate dose, the

pulsations of the heart and the respiration are accelerated, but the former are less ample, and the blood-pressure sinks considerably. This is the initial stage, which has not been described by Huzemann; it is followed by a second stage, during which the pulse and respiration become slower, while the blood-pressure rises to its normal level. If a toxic dose is given, the blood-pressure rises immediately, while the cardiac pulsations become much slower.

The second part of the thesis is devoted to a clinical study of the action of squill. We gather from it that it is a direct diuretic only in cases of dropsy originating from cardiac disease and in cachexia. Is this result due to the action of squill on the heart? It is probable; because in other dropsies, which were owing to alterations of the liver and kidneys, pleurisy or articular rheumatism, the diuretic action of squill has been found to amount to almost next to nothing.—*London Med. Record*, May 15, 1879.

### *Effects of Chloroform, Ethidene, and Ether in Blood Pressure.*

Drs. JOSEPH COATS, WILLIAM RAMSAY, and JOHN G. MCKENDRICK, of the Committee on Anæsthetics of the British Medical Association, report (*Journal of Anat. and Phys.*, April, 1879) that the facts obtained from their researches seem to them to warrant the following conclusions:—

1. Both chloroform and ethidene administered to animals have a decided effect in reducing the blood-pressure, while ether has no appreciable effect of this kind.

2. Chloroform reduces the pressure much more rapidly and to a greater extent than ethidene.

3. Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action, the pressure being reduced with great rapidity almost to *nil*, while the pulsations are greatly retarded, or even stopped. The occurrence of these sudden and unlooked-for effects on the heart's action seems to be a source of serious danger to life, all the more that in two instances they occurred more than a minute after chloroform had ceased to be administered, and after the recovery of the blood-pressure.

4. Ethidene reduces the blood-pressure by regular gradations, and not, so far as observed, by these sudden and unexpected depressions.

5. Chloroform may cause death in dogs either by primarily paralyzing the heart or the respiration. The variations in this respect seem to depend to some extent on individual peculiarities of the animals; in some the cardiac centres are more readily effected, in others the respiratory. But peculiarities in the condition of the same animal very probably have some effect in determining the vulnerability of these two centres respectively, and they may both fail simultaneously.

6. In most cases respiration stops before the heart's action; but there was one instance in which respiration continued while the heart had stopped, and only failed a considerable number of seconds after the heart had resumed.

7. The use of artificial respiration was very effective in restoring animals in danger of dying from the influence of chloroform. In one instance its prolonged use produced recovery even when the heart had ceased beating for a considerable time.

8. Under the use of ethidene there was on no single occasion an absolute cessation either of the heart's action or of respiration, although they were sometimes very much reduced. It can therefore be said that, though not free from danger on the side of the heart and respiration, this agent is in a very high degree safer than chloroform.

9. These results confirm and amplify those stated in a previous report, to the effect that ethidene does not compromise the heart as does chloroform. By the method of experimentation then employed, the effect on the blood-pressure could not be determined, and altogether the results here obtained are more exact and unequivocal.

It may be added that, since last report, ethidene has been given to a number of patients of all ages, with results which may be described as satisfactory. Given freely at first, it produced anæsthesia as rapidly as chloroform, and the effect could readily be kept up by comparatively small subsequent doses. The only drawback is that in some cases it produced vomiting; but it is not determined that it does so more frequently than chloroform, over which it has the further advantage of producing less excitement, and being more agreeable to the patients.

Iso-butyl chloride was given to three patients, but it produced considerable excitement, and proved an imperfect anæsthetic. It has therefore been abandoned.

#### *Benzoate of Sodium as an Antipyretic and Antiseptic.*

This drug is being much used in Germany at present as a prophylactic against diphtheria. The ground for its administration is the fact alleged by GRAHAM BROWN, working in Klebs's laboratory at Prague, that an animal saturated with it could not be inoculated with diphtheritic membrane.

Benzoate of sodium can be taken in doses of ten, fifteen, or twenty grammes per diem without unpleasant effects, even if long continued. It reduces fever less rapidly than quinine and salicylate of sodium, but the effect is said to be more persistent. Klebs (*Prager. Med. Wochenschrift*, iv. Jahr., Nos. 3, 5) has reported a case of diphtheria in a child which appeared to recover under its use, and Lezterich states (*Berlin. Klin. Wochenschrift*, No. 7, 1879) that of twenty-seven cases under his care (three adults, twenty-four children) all recovered but one. Hoffmann (*Berlin. Klin. Wochenschrift*, No. 16, 1879) reports twelve cases of diphtheria (four adults, eight children), all of which ended satisfactorily. The doses given were in the proportion of six grammes daily to a girl of eleven, five grammes to a child of three, and ten grammes to a woman of twenty-five years.

Hoffmann and Klebs have both seen good results from the benzoate in erysipelas. In acute rheumatism Senator has stated that it has succeeded in some of his cases where salicylic acid had failed; but Hoffmann (*loc. cit.*) has seen no good from it whatever, even after doses of ten grammes had been continued for over a week. In chronic rheumatism even Senator has obtained no benefit from its use.

Of other affections in which the benzoate has appeared to be useful, Hoffmann refers to albuminuria, both acute (post-scarlatinal) and chronic. In three cases the excretion of albumen diminished remarkably during its exhibition.

Lastly, Petersen (*Centralblatt Med. Wiss.*, No. 10, 1879) relates a case of puerperal fever in a patient of twenty-five which seemed to be hopeless. The temperature was 40° Cent., pulse 140 to 150, and the general condition very bad. He gave at first ten grammes benzoate per diem, and reduced the pulse to 130, with improvement of the symptoms as a whole. With the above dose he at last reduced the temperature to 39.5° Cent., and the pulse to 120, and the patient was able to sleep. On increasing the daily amount to fifteen grammes the effect became decided: the temperature fell to 38.5° Cent., and the pulse to 104, and complete recovery ensued.

We do not lay too much stress on any of the facts just mentioned, but they seem to us at least to warrant a further careful trial of the benzoate in similar and allied diseases.—*Med. Times and Gazette*, May 31, 1879.



*The Hæmatinic Properties of Dialyzed Iron.*

Dr. ROBERT AMORY has recently made some very careful observations (*Boston Med. and Surg. Journal*, April 3, 1879) by the aid of Gower's hæmacytometer, to determine the influence of dialyzed iron on the globular richness of the blood. An analysis of the clinical history of the five cases in which the observations were made shows that none of them had any organic disease; that they were aware of being out of their usual health; that they were unable to accomplish their regular work; that none had impaired appetite, nor feeble digestion; that three of the four suffered from neuralgia or headache; finally, all had diminished corpuscular richness of blood, varying from 3,350,000 to 4,000,000, and that under the continued use of ninety drops of solution of dialyzed iron per diem this condition of impoverished blood was replaced by an increase in the number of corpuscles, from 3,600,000 to 4,900,000, and the symptoms of ill health simultaneously disappeared with this improvement. We are informed that Wyeth's dialyzed iron was used in these observations.

*Physiological Action of Sclerotic Acid.*

It was announced some time ago by Dragendorff and Podwisotsky that they had succeeded in obtaining from ergot two new principles, *scleromucin* and *sclerotic acid*, and that to these principles the physiological activity of ergot was really due. A good sample of ergot ought to contain from 4 to 4.5 per cent. of sclerotic acid, and from 2 to 3 per cent. of scleromucin. The former substance is an amorphous crystalloid, soluble in water and very dilute spirit, insoluble in absolute alcohol and ether. A few experiments made on frogs appeared to show that sclerotic acid had a powerful effect upon the nervous system. NIKITIN has just carried out a more complete investigation of its properties in Professor Rossbach's laboratory at Würzburg. (Rossbach's *Pharmakologische Untersuchungen*, iii. 1 and 2.) The following are the principal conclusions at which he has arrived:

1. Sclerotic acid exhibits all the physiological and therapeutic actions of ergot, and ought, therefore, to be regarded as its principal constituent. Sodium sclerotate is identical with sclerotic acid in its properties, but is somewhat less powerful.
2. Cold-blooded animals are very susceptible to the influence of sclerotic acid. Among warm-blooded animals, carnivora are more readily affected by it than herbivora.
3. The chief action of sclerotic acid is upon the nerve-centres. In frogs, the reflex excitability of the spinal cord is first depressed, then annulled; in warm-blooded animals it is greatly reduced, but never wholly destroyed.
4. The peripheral terminations of the sensory nerves are only paralyzed by sclerotic acid when this is brought into direct contact with them. Neither motor nerves nor striped muscles are affected by it.
5. The heart's action is depressed by sclerotic acid in frogs, but not in mammals, even when the dose is relatively large.
6. Poisonous doses lower the blood-pressure and temperature.
7. The respiratory movements are always slowed; after a lethal dose, they cease before the heart stops beating.
8. The peristaltic movements of the intestine are always accelerated in warm-blooded animals.
9. The uterus, whether gravid or not, is always excited to contraction. Existing contractions are intensified.
10. The hæmostatic action of sclerotic acid in pulmonary hemorrhage may be accounted for by its lowering the blood-pressure. Its controlling influence on hemorrhage from the bowel or uterus is due to a different cause, viz., to the anaemia resulting from vascular spasm in those organs.
11. The immediate cause of death in mammals after a fatal dose of sclerotic acid is arrest of the respiratory movements.

The advantages to be anticipated from the substitution of sclerotic acid for ergot in actual practice are: the smaller dose required; the tastelessness of the powder;

its permanence when kept in a dry place. Neither the acid nor its sodium salt are suited for hypodermic administration; for, though they do not appear to set up local inflammation, they give rise to acute pain. The appropriate dose for the human subject may be determined without much risk of accident; for they are from ten to a hundred times less poisonous than the majority of medicinal alkaloids.—*London Med. Record*, March 15, 1879.

### *Physiological Action of Nicotine.*

RENÉ, the author of this interesting thesis (*Thèse de Nancy*, 1878), which has obtained an honourable mention from the faculty of Nancy (*Rev. Méd. de l'Est*, No. 4, February 15, 1879), has wisely abstained from traversing too wide a field of researches. He has omitted the action of nicotine on the heart and circulation, and restricted himself to the changes which occur in the nervous and muscular systems after the drug has been introduced into the body. The thesis is divided into three parts, the first is a historical sketch of the different opinions which have prevailed on the effect of nicotine at different times; the second part contains a detailed account of the author's experiments, and the third a detailed analysis of the results he has obtained. One hundred and seventy-two experiments were performed on frogs principally, then on dogs, cats, rabbits, guinea-pigs, mice, pigeons, and a snake. The poison enters the system by every avenue, and always produces quickly the characteristic toxic symptoms. If injected through the veins the effect is as quick as lightning. The statement rather contradicts what has been universally assumed about the slower action of the hypodermic injections or the quicker action of nicotine given as an enema. The immunity which certain animals are said to possess against it has not been proved, but the poisonous dose is not proportionate to the weight of the animal.

The intoxicated muscle loses, almost immediately after it has been pervaded by the poison, the power of contracting when stimulated by the galvanic current; the action of the nerves is also quickly paralyzed. This loss of contractility is due to direct intoxication, not to its having reached the maximum of contraction. The nervous motility is destroyed first and has ceased to exist when muscular contractility still persists, but the intoxication spreads rapidly from the nerve to the muscular fibre. The central nervous system is first attacked by the nicotine; the first symptoms of this excitation are the spasms, which the author describes in a very characteristic way. They consist in a trembling of the whole body very much like that experienced in a violent fit of shivering; it is a vibration of the muscular wavelets; a trembling of every muscle, or rather of every fibre; a series of tetanic shocks, which follow each other closely but are never united in one contraction. This trembling is principally due to an irritation of the cephalic centres rather than of the medullary centres. This is one of the most characteristic differences between strychnine and nicotine. Sensibility is also diminished or destroyed by nicotine, likewise the reflex power of the medulla; if the doses are not very high the non-striated muscles retain their power of contractility longer than the striated muscles.

After small doses the respiration is quickened at first, then it becomes gradually slower, but deeper and stronger, and stops. The expiration assumes the type which follows section of the pneumogastric nerve, this might lead to the inference that one of these nerves has been paralyzed by the action of the drug.

The blood presents a red colouring, which is characteristic of nicotine poisoning, but no particular changes have been detected in it by means of either the microscope or the spectroscope. The spermatozoa become motionless. Bile has no effect on nicotine, which produces the same symptoms, although less rapidly,

after having passed through the system of the vena porta. As yet no antidote has been discovered against nicotine ; strychnia has long been considered as such, but it only adds its own action to that of the former drug, thus rather increasing the effects of the nicotine, or remains powerless if the nerves and muscles are already paralyzed by the poison.—*London Med. Record*, May 15, 1879.

## MEDICINE.

### *Observations on the Subject of Croup and Diphtheria.*

Dr. W. H. DICKINSON, Chairman of the Committee which presented to the Royal Medical and Chirurgical Society the recent report on Croup and Diphtheria, terminated the debate which it elicited, as follows:—

I will recapitulate what it is that we suppose ourselves to have made out. First, I must join issue with my respected friend, Dr. Wilks. I never was more surprised in my life than to hear him say that he thought the term “croup” a sufficient and satisfactory definition of a disease. The fact is that croup only names a group of symptoms, it does not define a disease. It includes two most different conditions, which require different or even opposite treatment, and of which one is nearly always fatal, and the other nearly always not so. The most strongly marked distinction which came out in the course of our inquiry is that between membranous and non-membranous affections of the larynx—and both are called croup. Membranous affections of the larynx, be they of what sort they may, are fatal in a proportion of about 90 per cent. We have always known that these affections—whether we call them croup or diphtheria—are very fatal ; but I was hardly prepared for the terrible mortality which our tabulations disclosed. Dr. Gee’s table from the books of the Hospital for Sick Children, showed that of sixty-three children affected with membranous inflammation involving the larynx, only three recovered. Ten per cent. of recovery is about the average, and even of this small proportion there are few who survive save with the intervention of tracheotomy. It might be suggested that this exaggerates the danger of the disease, in consequence of the inclusion of *post-mortem* evidence. Membrane was found after death which would not otherwise have been seen, and thus the case was classed as membranous only because it was fatal. If the child had got well, the membrane might never have been found, and the case been placed in another category. But the fact is that we get to much the same result, even though *post-mortem* evidence be entirely excluded. If a child has laryngeal obstruction, and membrane is seen in its throat, the chances are that it will either die or be tracheotomized, and not improbably both. Putting aside all *post-mortem* evidence, one of our tables presented a series of thirty-two such cases, in which membrane was seen during life ; among them were eight recoveries, but only two without the operation. Thus it is clear, however it is viewed, that membranous inflammation of the larynx—without as yet dealing with its possible separation into diphtheritic and non-diphtheritic—is a disorder of extreme deadliness.

We will now turn to another picture. There is a class of cases, not always so readily distinguished from those of membranous disease, in which dyspnoea is often severe and protracted—often so much as to suggest operative relief, but in which no membrane ever comes to light—and which almost invariably end in recovery ; not quite invariably, for in a very large recorded experience a case is now and then to be found in which non-membranous croup has ended

fatally. The Hospital for Sick Children provides one such case; Guy's Hospital has given us three; Dr. Johnson has mentioned two in the course of the debate; but these are all the instances which can be got together out of a great field of pathological experience in which croup—using the term in its general sense—has proved fatal without the formation of membrane. Thus non-membranous croup is as remarkable for its favourable issue as membranous croup is for the reverse. It might be suggested that non-membranous croup only differs from the membranous in being a smaller degree of the same sort of change, but there are several reasons which show that the difference is not in degree, but in kind. Many of the non-membranous cases are very severe—as I said, but narrowly escaping tracheotomy; some are long-continued, so that it is not the mildness or shortness of the attack that makes the difference. Then other distinctions show themselves: non-membranous croup attacks boys more than twice as often as girls; it is apt to recur in the same individual, which the membranous disorder is not; it is not attended with glandular swelling—though this distinction is not of great value, as glandular swelling is not necessarily present when the affection is membranous; and lastly, with non-membranous croup the urine is seldom albuminous, with the membranous affection it is albuminous more often than not. In eighteen non-membranous cases in which the urine was examined, it was found to be albuminous but twice; and even this statement exaggerates the frequency of albuminuria in the circumstances, for one of the two in which it was found was a case of somewhat incomplete and uncertain character. To say that albumen was found once in seventeen cases of non-membranous croup would probably be more accurate. But with the membranous affection albumen was found in more than two-thirds of the cases examined—in forty-nine out of sixty-six cases.

Then another and very important difference is to be made out in the causation of each form of disease; non-membranous croup is often definitely traced to a distinct exposure to cold; membranous croup seldom so, if ever. It is often attributed to cold by mothers—they will attribute anything to cold—but the association is never conclusive. On the other hand, we have indubitable evidence that the membranous affection is often produced by infection by foul air or foul water, or some such cause. Allowing, then, that non-membranous croup and membranous croup are distinct diseases, I will come to membranous croup by itself, and thus approach the especial object for which the committee was formed.

The question is, Have we here one affection, always the result of a specific poison, to be called diphtheria, or must we divide the class mainly into two—one diphtheritic and specific; the other, due to common inflammation, to be called membranous croup? I am bound to say that the evidence before us gives us no means of making any such division in the cases which ordinarily come before us. We must fully admit, however, that membranous laryngitis may come on in connection with various other disorders—with scarlatina, measles, smallpox, and others—and that it comes on also as a result of various accidental laryngeal irritations—boiling-water or steam, a cut in the throat, a pea in the larynx, acids, eau de Cologne, and so on; but these cases, whether in connection with the exanthemata or accidental irritants, are few and exceptional. They may conceivably be explained, as Dr. Johnson has explained them, by the chance concurrence of the diphtheritic influence with the fever or accident. But it seems improbable that two separate causes of the same result should thus exactly concur. This is almost the only point in which I personally should not quite go with Dr. Johnson. Dr. Buchanan has calculated how often the various exanthematous diseases should fall together with diphtheria, supposing their concurrence to be a mere matter of chance. He shows that for one quarter of a year, for which he made the calcu-

lation, diphtheria fell with scarlatina about as often as chance would give independently of any pathological association. But the membranous affection fell with measles about twice too often to be thus explained. Dr. Buchanan probably would not attach any conclusive weight to figures thus derived from the bare nomination of the diseases in the Registrar-General's report, but so far as they go they are in favour of the view that certain conditions, apart from the special diphtheritic influence, may develop membrane in the air-passages. I think that the probability is that these febrile and accidental irritants are able themselves to produce the membrane in question. These instances are so few as to be numerically and practically unimportant; however, they are to be considered in forming a theory of membranous inflammation. But the existence of these cases prevents our dogmatizing too absolutely. If we had dogmatized more we should have been more distinct in our conclusions, and should have met more exactly the views of some members of the society. But we thought it better not to dogmatize beyond the dogmatism of nature. But, putting aside such cases as have been mentioned, we look in vain for any ground on which we can further divide the instances which daily occur of membranous inflammation of the air-passages. We cannot find any basis on which we can say that this case is of common inflammation, and that that is diphtheritic. We find no distinction in rough anatomy nor in microscopic. Dr. Barclay says he calls it croup, and regards it as simply inflammatory when the membrane is confined to the trachea. I have no doubt that he means when it is confined to the trachea and larynx [Dr. Barclay assented]. But our tables show instances in which the membrane has been so limited, and yet the disease has been clearly traced to infection, or poison conveyed by air or water. There was an escape of sewer-gas into one of the wards of the Hospital for Sick Children. This caused diarrhoea in some subjects, in one pharyngeal diphtheria, and in another laryngeal diphtheria, in which the membrane was limited, as far as could be ascertained, to below the epiglottis. The child recovered after tracheotomy, so that we had not the warrant of a *post-mortem* examination; but the evidence otherwise was very complete, and the tables give other examples of the same sort. And not only, as shown in such cases, may membranous inflammation of the larynx be produced by causes which set up pharyngeal diphtheria, but membranous inflammation, thus limited, may set up by infection, in another person, the pharyngeal disease—as in the instance Suckling, in one of our tables referred to by Sir W. Jenner. In the next place we have no warrant, as far as causation is concerned, to call some cases simply inflammatory, while others are diphtheritic. We find among these cases many which begin insidiously without ostensible cause; others in which drains, foul water, and insanitary surroundings are apparently responsible; but none in which cold can be, otherwise than somewhat vaguely, ascribed as the cause. Neither can we say that there is any distinction to be made out by the help of albuminuria or by any other test that we have been able to apply. The conclusion, then, is fairly this, that membranous inflammation of the larynx is in a vast majority of cases diphtheritic. The conclusion I believe to be fully warranted by the evidence before the committee; it does not represent the belief (if I may speak of myself personally) that I began with, but I could not resist the evidence which the collected cases presented. To this conclusion there is a corollary which may not be out of place in a society, before all things, of practical medicine. Seeing the difference of issue between non-membranous croup and laryngeal diphtheria, notwithstanding their frequent similarity in symptoms, it becomes of the highest importance, in every case of laryngeal inflammation, to ascertain as far as may be the presence or absence of membrane. I have already referred to the points of distinction, among which albuminuria holds an important place. If

membrane be present and in the larynx, there is little hope but in tracheotomy, which, therefore, there is no reason to delay. But if membrane be not present, the child will almost surely recover without operative intervention, notwithstanding that the symptoms be severe and even somewhat lasting. The operation in such a case can be but a needless and possibly a fatal complication. I should have wished to have said a word, did time permit, upon what was so ably advanced by Mr. Jonathan Hutchinson. No doubt diphtheria is less distinctly isolated than many other diseases, less so than scarlet-fever or typhoid—we have said as much in our report—but it is communicable, and I do not see why it should not be called specific. It has near relations, however, to other disorders, more particularly to one which Mr. Hutchinson especially referred to—follicular tonsillitis, or the spotted throat. This may arise, as we have evidence to show, from the contagion of diphtheria; besides which, it may accompany diphtheria in the same person, the tonsils being spotted, while perhaps there is continuous membrane elsewhere. Then again we have curious evidence that diphtheria may be only one of several disorders engendered by one and the same cause. Of a group of persons who drank of a specially poisonous well—drainage going into it—two had obstinate diarrhœa, one erysipelas, one purulent ophthalmia, one pharyngeal and one laryngeal diphtheria.—*Med. Times and Gazette*, May 17, 1879.

#### *Chloral Hydrate in Diphtheria.*

Professor von ROKITANSKY (Innsbruck) has seen excellent results from half-hourly local applications of hydrate of chloral in a 50 per cent. solution in three desperate cases of diphtheria. The pain was slight, and the effect very rapid. As soon as the formation of granulations was observed, weaker solutions of the remedy were gradually exhibited.—*Med.-Chir. Rundschau*, Heft 11, 1879.

#### *Chorditis Vocalis Inferior Hypertrophica.*

Professor SCHROETTER discusses (*Monatsschrift für Ohrenheilkunde*, Nov. 12, 1878) this morbid process, which has first been described under this name by Gerhardt. It consists in a swelling originating from the free border of the true vocal cord and bulging into the interior of the larynx, obliterating in some cases considerably its lumen. Cases of this sort have been described by Czermak, Gibb, Türk, Scheff, Burow, Krishaber, Catti, but the views of these and other authors on the nature of the affection differ considerably from each other. Czermak considers the process as a "scrofulous infiltration of the mucous membrane," Türk as "chronic tumefaction," Scheff as "hypertrophy," Burow as "chronic inflammatory hypertrophy of the lower part of the true vocal cord," von Ziemssen calls it "a true induration of the mucous and submucous tissues, originating from hyperplasia of the connective tissue." Catti agrees with Gerhardt's views, Voltolini proposes the name of "inflammatio hypertrophica subvocalis," and Ganghofner consider the process as a part of the disease described by Stoerk, and called by him "chronic blennorrhœa of the mucous membranes of nose, larynx, and trachea." Schroetter does not share in any of these views. Although admitting that the morbid process consists in later stages in a tumefaction or induration of the submucous tissue, he considers that it does not deserve any special name, as the same process has been observed on other parts of the larynx, and, as it is not necessarily a primary one, but is sometimes occasioned, as seen by himself, by primary perichondrial disease. He thinks, however, that this question is at present not to be decided definitely, as no *post-mortem* examination has yet been made in such a case. With regard to treatment, he advises appli-

cation of caustics, of the galvano-cautery, and especially systematic introduction of laryngeal bougies, before the last help, tracheotomy, is resorted to.—*London Med. Record*, May 15, 1879.

### *Laryngeal Crisis.*

Under this name CHARCOT describes (*Gazette des Hôpitaux*, No. 1, 1879) a very interesting laryngeal affection attending on or preceding sometimes for several years the development of locomotor ataxy. It is characterized by a feeling of strangulation and of heat in the larynx; and by a peculiar laryngeal spasm, followed at once by falling down, and by an epileptiform attack. This may repeat itself several times in succession, as soon as the patient has again become conscious. This vertigo is not followed by nausea, and sometimes it is limited to the laryngeal spasm, without being followed by the epileptiform attack. Generally the patient falls forwards. His disease is generally mistaken for cerebral congestion. The entire attack is produced by an irritation of the superior laryngeal nerve (?). Professor Krishaber had examined the case which was shown by Professor Charcot as an illustration of the disease, and had found that the glottis was greatly narrowed, much more than normally. [It is much to be regretted that this statement is not precise with regard to the permanency of this laryngoscopic appearance, because this factor is of fundamental importance for the pathology of the entire affection. If the narrowing of the glottis be permanent in some degree, and this seems to be the case, from Professor Charcot's description, it would appear that the posterior crico-arytenoid muscles, which are supplied by the laryngeal recurrent nerve only, must have been involved in the morbid process. Altogether, the symptoms of the case described bear so strong a resemblance to those of an undoubted case of paralysis of these muscles, accompanying locomotor ataxy, shown by the reporter in the Clinical Society of London in April, 1878, and recorded in the Society's *Transactions* of the same year, that the reporter cannot help believing that the case shown by the celebrated professor, in illustration of his views on the certainly very rare symptom of locomotor ataxy, on which he lectures, was one of not yet far progressed paralysis of the posterior crico-arytenoid muscles, accompanying the central disease.] Professor Charcot believes that we have no present remedy against these attacks, but thinks they might cease spontaneously.—*Lond. Med. Record*, April 15, 1879.

### *Laryngeal Phthisis.*

In an interesting clinical paper on this subject (*Medical Record*, May 24, 1879), Dr. F. H. BOSWORTH, Lecturer on Diseases of the Throat at Bellevue Hospital Medical College, emphasizes the following points:—

1st. Laryngeal phthisis may develop from a simple catarrhal inflammation, if there exists an impaired state of health from any cause.

2d. The progressive stages are catarrhal infiltration, catarrhal ulceration, and follicular inflammation, and tubercle plays no part in its primary causation or development.

3d. The disease is far more amenable to treatment than is generally taught, especially if treated in the earlier stage.

4th. Tracheotomy is justifiable as a remedial measure, when local remedies fail to relieve, and before it is demanded by dyspnoea from inflammatory stenosis.

### *Use of the Carbolic Spray in Catarrhal Affections.*

MORITZ has published in No. 1, 1879, of the *St. Petersb. Med. Woch.* an article on the anticatarrhal properties of carbolic acid, of which we give the fol-

lowing abstract. 1. In colds, fresh catarrhs, *i. e.*, when the first symptoms show themselves, such as repeated sneezing, running eyes, a disagreeable pricking feeling in the throat, nose, and eyes, and so forth, it will suffice, according to the author, to inhale a spray of a 2 per cent. solution to cut short the cold. The atomizer is held at about  $1\frac{1}{2}$  feet distance from the face, and the patient breathes through the nose five to six times. This operation is repeated every half-hour, till the symptoms have disappeared. Fresh exposure to the cold may bring them on again, but then all we have to do is to repeat the proceedings. 2. In catarrhal complications of measles, the effect of the carbolic spray seems most powerful. The author does not believe that the spray could cut short the measles, but he has derived great advantage from saturating the atmosphere with it. This is done in the following way. Several towels are dipped in a 3 per cent. solution of carbolic acid and hung over the bedsteads of the patients. This must be repeated four or five times daily, and specially during the night. Once or twice during the day the patients must be carried, with their beds, into the next room, for the sake of giving the bedroom a thorough airing. This is continued till the rash has come out fully, and the temperature has begun to sink. When the catarrh is a little better, about the fifth or sixth day of the illness, it is advisable to stop the carbolization. 3. Whooping-cough. It is said that inhalations of carbolic acid have proved useful; the author, however, gives the preference to disinfecting the air as above with cloths and towels. It seems as if the course of the cough were shortened by it. The only drawback is the occasional occurrence of pneumonia, which, however, has never been known to end fatally. 4. Infectious spring catarrhs. They must be stopped from the very beginning, with the inhalations. Later on the air must be carbolized during the night, and occasionally during the day. 5. Asthma following an acute or chronic catarrh of the bronchi. Both the spray, and the spreading of a cloth soaked in the carbolic acid solution over the bedstead at night have often given the most surprising results. 6. Subacute catarrhs of the larynx and pharynx, combined with nightly attacks of coughing, such as often occur in children. Cloths hung up at night. 7. Chronic catarrh of the bronchi, with profuse secretion, generally gets better in an atmosphere saturated with carbolic acid, as well as after inhaling it. This treatment has proved unsuccessful in acute catarrhs of the bronchi, pharynx, and fauces, where the parts are very red; the secretion is profuse, and the cough very violent, such as often occurs in stout elderly men, in the catarrh which often complicates phthisis, and in the spasmodic cough of hysterical women. In the latter cases the carbolic acid is apt to cause violent headache.—*London Med. Record*, March 15, 1879.

#### *Case of Calcification of the Lungs.*

We take the following interesting account of a rare case from the *Le Mouvement Médical*, March 8, 1879, to which journal it was transferred from the *Gior-nale Internazionale*.

A woman, aged 27 years, who was suffering from dilatation of the stomach, following a stricture of the pylorus, died at the Hospital Rodolfi. At the necropsy, the stricture, which had been caused by the cicatrization of a round ulcer, was found, together with the symptoms of advanced marasmus, and a peculiar state of the surface of the lungs. Some portions of the latter were not soft, did not give way when pressed, and presented a blackish appearance, combined with a greater consistency than is usually the case. The parenchyma was rigid, tough, and when pressed with the finger retained the impression; a frothy liquid oozed out of it when transverse cuts were made; this naturally led to the supposition that the parenchyma of the organs was consolidated. It was, however, discovered under the microscope that the connective tissue between the alveoli and



infundibula was not transparent, but contained some needle-shaped calcareous deposits.

The lungs were found to contain about 14 per cent. of inorganic matter, which consisted principally of phosphates of chalk and magnesia. All the other organs, the bones included, were also submitted to a most careful examination; but the kidneys alone presented manifest symptoms of calcification, the calcareous matter being deposited in the urinary tubules.

The etiology of the disease is very obscure, as nothing was known about the former life of the patient. It was therefore supposed that the cause of this extraordinary illness was a chronic inflammatory process in the lungs, and that it was the effect of what Virchow calls calcareous metastasis. At a discussion on the subject, which took place between the professors of the Royal Society of Medicine, Professor Ramberger said that he thought the limestone must have penetrated into the lungs from the outside; but in what way he could not exactly say. The circumstance that the lungs and kidneys alone contained calcareous matter, would lead to the inference that the presence of the latter in the body can only be ascribed to inhalation through the lungs.—*London Med. Record*, May 15, 1879.

#### *Aortitis accompanied by Neuritis of the Cardiac Plexus.*

CUFFER records (*La France Médicale*, January 22) the following case:—

The patient, a woman, 45 years of age, was admitted into La Pitié last November under the care of Dr. Pétér. She had suffered for six weeks in the precordial region as if she had “a bar across the chest;” soon the pains radiated towards the neck, the shoulder, and the left arm, and a feeling of numbness extended down this arm even to the little finger. From time to time she had pains in the left jaw, and some difficulty of swallowing about the upper part of the œsophagus. These pains were continuous from the commencement, but with well-marked exacerbations, resembling in every respect attacks of true *angina pectoris*. On examination, the places above mentioned were found somewhat painful to the touch, and the pain was increased by pressure. Upon compression of the vagus and phrenic nerves in the neck on the left side, very severe pain was felt, not only at the point of compression, but also in the cardiac region, especially at the base. Moreover, a peculiar pain was felt on pressure with the finger in the intercostal spaces along the left border of the sternum. Finally, the attachments of the diaphragm on the left side were very painful on the slightest pressure. These characteristic pains became very violent at certain times, and then the stomach became distended, the respiration manifestly impeded, the heart's action excited, and the surface temperature lowered. M. Pétér considers the *continuity* of the pain, with the occasional exacerbations, resembling attacks of ordinary *angina pectoris*, as of diagnostic value and symptomatic of the lesion, which he names *neuritis of the cardiac plexus*, with concomitant *neuritis of the phrenic nerve*. To the inquiry, what gave rise to this neuritis, the answer is inflammation (aortitis) and dilatation of the aorta. There is a very notable bulging of the chest-wall below the left clavicle; percussion here is painful, but, by means of the plessi-graph, it can be made out that the aorta in this region measures 9.5 centimetres in width. The origins of the subclavian arteries are raised so that they are felt beating in the neck much more strongly than is normal. There is neither pulsation nor bruit, nor thrill over this prominence. The area of cardiac dulness is increased; there is no evidence of mitral or aortic insufficiency; the only abnormal murmur heard is a soft systolic souffle at the base. There obviously exists aortitis, with dilatation, situated principally in the arch of the aorta. There is tenderness on percussion behind, along the left side of the spine in the dorsal

region. This is looked upon as another sign of aortitis. There is also evidence of pressure on the left bronchus; and the left brachio-cephalic vein. There is almost complete absence of respiration over the left lung, and there is œdema of the left hand. There is but little difference in the radial pulses.

The treatment, which has been attended with so much benefit that the patient thinks herself cured, consisted in the application of flying blisters to the cardiac region, followed by that of permanent cauteries.—*London Med. Record*, May 15, 1879.

### *Prognosis in Cases of Diabetes complicated with Gangrene.*

PEYROT has arrived at the following conclusions (*Thèse de Paris*, 1878; and *Bull. Génér. de Ther.*, March 15):—

1. The prognosis is always more unfavourable in cases where the affection has not been early recognized, or where it has progressed rapidly, and the patient is very weak.

2. Incisions prove very useful in cases where an inflammatory process exists, but aggravate the condition of the patient if he should be suffering from spontaneous gangrene.

3. Surgical intervention is always useless in furunculous anthrax, but necessary in the diffused form.

4. Large incisions may be practised in cases of diabetic phlegmon without perhaps incurring any great risk; with the exception that the edges of the wound have a strong tendency to modify. But this plan seldom prevents the wound from healing, and only retards the process of cauterization.

5. In cases of superficial gangrene the patient's life is seldom in danger, and, as a rule, he recovers.

6. Deep-seated gangrene of the extremities is almost always fatal, being the final symptom of the glycosuric condition; in short, it may be said, that hitherto no case of diabetic pulmonary gangrene has been known to recover, this complication always ending fatally.—*London Med. Record*, May 15, 1879.

### *Mucous Concretions in the Intestine.*

M. HENRI HUCHARD reports an interesting case of intestinal concretions (*La France Médicale*, January 15, 1879). A woman, aged 50, suffered for some time from obstinate constipation, due partly to anæmia, and partly to a fibroid tumour of the uterus pressing on the rectum. After a short attack of diarrhœa, she passed a mass of gray threads which interlaced, and formed a body the size of a pigeon's egg. The filaments were 35 centimetres in length on average, with a breadth of 8 millimetres. They were hollow, resembling cooked macaroni. After the evacuation the patient improved. M. Rémy examined the mass, and described the cords as being longitudinally striated, and unaltered by acetic acid, their nature being, therefore, mucous. This striated structure contained leucocytes, blood corpuscles, deformed cylindrical cells, and oil globules. M. Huchard does not believe, with M. Raynaud, that such membraniform mucous concretions are caused by desquamation of the mucous membrane, but supports the views of M. Debove, that a hypersecretion of the mucus coats the intestine, and, subsequently becoming detached, contracts to form the tubular filaments. The hypersecretion is usually brought on by constipation, not as a rule neurotic. Occasionally the cause would seem to be herpetic, the process then resembling herpetic pseudo-membranous dysmenorrhœa. If catarrhal inflammation be present, it is secondary to constipation.

*A Rare Case of Chronic Coprostasis.*

Dr. FLECK, of Marienbad, has published in the *Wien. Medicinische Blätter*, the following curious case of chronic constipation, which he ascribes to some anomaly in the innervation of the intestines. The patient, a Dutchman by birth, was of delicate constitution, but well nourished, and had always been more or less subject to constipation; but for the last two years his bowels had become torpid to a most alarming extent, moving only from five to six times a year. It is true that, in the intervals between these evacuations, the patient passed a very small quantity of hard feces once in six, eight, or ten days, but these motions would hardly amount to the remains of one meal. Two or three days before one of the principal evacuations occurred, the patient began to feel ill, his sleep was disturbed, he was restless, felt disinclined to work, had a very uncomfortable feeling in his back, etc. Then, after a sharp attack of colic, he passed an enormous quantity of horribly offensive feces; then he felt better for two or three hours, when some more feces were passed, and so on till he had had four or five motions during the day. On the following day, he only had a slight attack of diarrhœa, after which his bowels relapsed into their usual torpid state; but he felt so wretched and exhausted for several days afterwards, that he dreaded the evacuation more than the coprostasis. At the examination, it was found that the feces were principally accumulated in the ascending and transverse colon; these intestines could not only be felt, but also seen through the abdominal walls; the abdomen was soft, not much distended; the diaphragm was pushed upwards; all the other organs were perfectly normal. The patient had tried every possible remedy to cure himself of this affliction, including electrotherapy, hydrotherapy, and very voluminous enemata, but had never succeeded in obtaining relief. He had at last come to Marienbad, where he drank the water and took baths; the result of which treatment was, that the bowels moved once in two or three days. The author tries to explain this curious fact by some anomaly in the innervation of the intestines, owing to which they remained torpid till stimulated by some unknown cause, or perhaps through a reflex act, when the accumulated feces were suddenly expelled.—*British Med. Journal*, April, 1879.

*Hedysarum Gangeticum in Dysentery.*

Assistant-Surgeon AMRITO LALE DEB writes in the *Indian Medical Gazette* for March: I am desirous to bring to notice the medicinal virtues of the root of *hedysarum gangeticum* in the treatment of dysentery. Within the last three years I have tried this medicine in numerous cases, and I am fully convinced of its efficacy in dysentery. The plant from which the root is obtained enters into the composition of our *Doshomool Panchon* (decoction of ten herbs), which has been in use in the treatment of fever from a very remote period by native *koberajes*. But the use of the root in dysentery is not mentioned in any of the works on Hindoo medicine, so far as I am aware. The mode of administration of the medicine is simple enough. The root in its fresh state is ground down to a pulp on a curry stone with a little water, and may be given three or four times a day, or every four hours, as the case demands, in doses varying from 30 to 40 grains each time, in adults. It does not produce nausea or any unpleasant sensation on the system. Under its use the motions become feculent, blood and slime disappear, tormina and tenesmus subside, and the patient is gradually restored to health. It is perfectly innocuous, and can be safely given at all ages. In point of medicinal virtue it stands next to *Ixora coccinea*; is especially adapted to acute dysentery of moderate severity. In severe cases, the administration of an open enema is requisite, conjointly with the internal administration of the remedy.

I am led to think that, under the use of this valuable indigenous drug, the number of chronic cases will become rare among the natives of this country, and that it will consequently reduce human suffering and the high rate of mortality. Its Bengalee name is *Salpany*. It belongs to the natural order *Leguminosæ*. It grows wild in many parts of Bengal in the rainy season, but can only be found sparingly at other seasons, when cows graze upon it and the branches and leaves are lost by which it can only be distinguished. However, it can be had to any extent and at all times of the year, especially by cultivation. I would earnestly recommend its use in all the hospitals and in private practice in suitable cases, and should its remedial virtues be proved beyond any doubt by professional men, by giving it a fair trial, it will be a valuable auxiliary in the treatment of dysentery.—*London Med. Record*, May 15, 1879.

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*On Chronic Bright's Disease, and its Essential Symptoms.*

Dr. F. A. MAHOMED, Medical Registrar to Guy's Hospital, has recently published in the *Lancet* an interesting article on this subject, and his views are briefly summarized (*Lancet*, March 29, 1879) in the following propositions:—

1. Albuminuria, though occasionally produced by other causes, is generally the result of increased pressure in the capillaries of the kidney, either venous or arterial.

2. Neither albuminuria nor dropsy are usually present in chronic Bright's disease; when present they indicate acute or epithelial changes.

3. The blood-condition which produces the high arterial pressure of Bright's disease is the primary condition, and is not secondary to deficient renal excretion, as held by Bright himself, and subsequently by nearly every authority upon the subject.

4. The most generally accepted account of the disease and its symptoms fails to recognize it in by far the larger number of cases in which it exists.

5. Cases present themselves wearing the aspects of various forms of heart disease, of bronchitis, of cirrhosis, of cerebral disease, and many other conditions, in which we can only discover the existence of chronic Bright's disease, as the *fons et origo mali*, by the signs of high pressure in the arterial system.

6. The cardio-vascular changes, when found alone, may be taken as evidence of the existence of the disease.

7. Similar changes to those found in the kidneys exist also in the mucous membranes, in the skin, and in other parts.

8. The condition of high pressure is almost constantly present in old age, and, in one form or other, brings about a large proportion of the deaths in persons over fifty.

9. The existence of high arterial pressure in the pulse of young persons indicates a diathesis, and is of grave importance.

10. The same condition, being of frequent occurrence, after the age of fifty is not of such great importance, unless present to an extensive degree; it then produces serious symptoms, and calls for active treatment.

Of these propositions, Nos. 6 and 7, and in great measure No. 3, have been already enunciated by Sir Wm. Gull and Dr. Sutton.

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*Case of Paralysis of the Ulnar Nerve.*

The following fact is published by SABOURIN in the *France Médicale*, February 8, 1879: The patient, C. L., æt. 27 years, entered the Lariboisière Hospital as out-door patient, complaining of an affection of the left arm. He said that two days previously, on waking in the morning, he found that his left arm was, as he supposed, paralyzed. He could not exactly say in what position he

had been lying when he awoke, but stated that he always went to sleep with his head on his right arm. The arm was also entirely anæsthetic; the patient did not suffer in the least, but could neither extend nor bend his hand or his fingers, which were stiff, and fixed in a particular position. He did not apply to any doctor, but the next day he could move his wrist very slightly, and with great effort. The day after that he made up his mind to go to the hospital, although he said that he already felt much better. On being carefully examined, it was found that the whole of the left arm was perfectly free in all its movements, the forearm was a little bent, but not much, and no stiffness could be felt in the elbow-joint. The axis of the hand was on a line with that of the forearm, the member itself being in a position between pronation and supination. The fingers were a little bent in all their joints, and all at the same angle. The peculiarity which was most striking in the member was the rigidity of the hand and the fingers, which might have been compared to the stiffness of a corpse. The flexor tendons were very prominent on the anterior surface of the wrist. At first sight nothing suggested paralysis; on the contrary, the phenomenon might rather be called a contraction of all the muscles of the forearm and the hand, the latter remaining absolutely fixed in its position when the forearm was moved by force. No trace of any traumatic affection could be discovered on the arm, neither was there anywhere tenderness on pressure. The hand and forearm were completely insensible to pain, while the sensibility of the upper part of the arm, from the elbow-joint upwards, was normal. The patient being asked to move his hand, made such violent efforts that the perspiration streamed down his face, and at last succeeded in bending the dorsal surface of his hand towards the arm, to an angle of about  $45^{\circ}$ . The efforts being continued, he could stretch his fingers a little, but both the hand and fingers did not remain long in that position, and gradually returned into the former one. Flexion of the hand and fingers proved still more difficult at first, though the patient succeeded at last. It was impossible to stretch the fingers, and wrist could only be moved with great difficulty. The faradic current having been applied to the extremity, it was found that the electric contractility of the muscles was the same all over the arm, the contractions being perhaps a little feebler on the forearm. There was nothing in the previous history of the patient which might have thrown light on the origin of this extraordinary affection, neither syphilis, alcoholism, nor overwork, etc. The patient was ordered to rub his hand and forearm repeatedly. When he again presented himself at the hospital, a few days later, he was much better. Sensibility had been restored to the whole of the forearm, the hand, and the fingers, with the exception of the fourth and fifth fingers and the corresponding parts of the carpus and metacarpus. All the movements of the forearm and the hand could be executed, but very slowly only; the patient could, however, use his thumb, forefinger, and third finger. He was then faradized and sent home. A week later he came back, almost well, the movements of the little finger alone being perhaps a little feeble and slow. He has not been heard of since.—*London Med. Record*, May 15, 1879.

#### *Case of Rare Vaso-Motor Disturbance in Leg.*

At a late meeting of the Clinical Society of London (*Lancet*, April 26, 1879), Dr. ALLEN STURGE read notes of a case of rare vaso-motor disturbance in the leg. The patient, a man aged twenty-nine, began to have attacks of redness and swelling, with a feeling of heat, in the right great toe about four years ago. They came on after he had been standing some time, lasted for two or three hours, but went off more quickly if the foot were kept elevated; they increased in severity, and eventually reached the thigh and buttock. Eighteen months after the first onset the burning felt when the foot was put to the ground obliged the patient to give up work. The left foot and leg have begun to feel hot during

the last six months. The attacks are brought on by hanging the leg down, sitting near the fire, wrapping it up warmly, or by much excitement. When first admitted to the Royal Free Hospital he rarely passed twenty-four hours without an attack. For more than two years the right leg had been wasted. The circumference of the right thigh was one inch and three-quarters less than that of the left; that of the right calf one inch and a quarter less. There was marked increase in the reflex irritability of the muscles. Their electrical reaction was altered; there was great diminution of reaction to both constant and induced currents when the rheophores were applied to the muscles, but when to the nerves both currents produced good reaction. Now in atrophy from disease of the spinal cord there would be loss of reaction to the induced current in both portions, and to the constant current when the rheophores were applied to the nerves, and good, or even increased, action when they were applied to the muscles. The surface temperature, taken by Stewart's surface thermometer, was below  $75^{\circ}$  (the lowest point in the scale); in the attack it was about  $93^{\circ}$ , always lower on the dorsum than on the sole. Dr. Sturge remarked that this belonged to a class of cases of which a description was published by Dr. Weir Mitchell in the *American Journal of the Medical Sciences* for July, 1878. Dr. Mitchell had seen five cases, and quoted six from other sources. He states that the disease nearly always occurs in men, following some constitutional disease, or after much walking. It begins usually in the ball of the foot, and gradually extends to the rest of the limb. The cause of the disease described by Dr. Mitchell much resembles that above given. Two of his cases were associated with spinal symptoms, such as weakness of the legs, atrophy of muscles, etc. But Dr. Sturge pointed out that in this case the atrophy was shown by the electrical reaction to depend on a local rather than a spinal cause. He suggested that the disease had been brought on by the prolonged over-excitation of the vaso-motor centre, resulting from long exposure of the feet and legs to wet and cold, and that the conditions were allied to the irregular action excited in other centres from over-work, as in writers' cramp.

Dr. S. MACKENZIE had now under care a similar case. The patient, an engine-driver, had suffered with attacks of pain and heat in the foot, the veins of which swell up, and he is quite exhausted after walking only half an hour. The affection had lasted over two years, and was probably induced by the different temperature to which his extremities were exposed as compared with the rest of the body. At first Dr. Mackenzie thought the case one of disease of the spinal cord, for the muscles were wasted; but there was good tendon-reflex, and at length he concluded it fell under the head of the cases described by Dr. Weir Mitchell. He had no doubt that it frequently occurred, but that its true explanation had hitherto been wanting.

Dr. POORE said that the theory advanced by Dr. Sturge was that the phenomena were due to the over-stimulation of vaso-motor nerves, and his comparison of this to the over-stimulation of muscle in writers' cramp was interesting. In writers' cramp and allied disorders it was common to find considerable evidence of vaso-motor disturbance, people with over-fatigued muscles often complaining also of heat and cold in the affected limb. The electrical condition of the muscles was the same in the cases referred to by Dr. Sturge, and in the "fatigue diseases," showing a slight diminution in their irritability, whilst the reaction of the nerves was about normal. He asked if there were any hyperæsthesia, nerve-tenderness, or sign of neuritis in Dr. Sturge's cases.

Dr. STURGE, in reply, said Dr. Mackenzie's case fell under another head, amongst the class of cases described by Weir Mitchell, than his own, there being less vascular dilatation. There was no hyperæsthesia or tenderness over the nerves of the limb.

## .SURGERY.

*Report on Pyæmia.*

The concluding meeting of the Pathological Society of London for this session was signalized by the presentation of the report of the Committee appointed to inquire into the nature, causes, and prevention of the infectious diseases known as pyæmia, septicæmia, and purulent infection. The report may be said to have fallen under the three heads of etiology, semeiology, and pathology. In inquiring into the first of these subjects, the committee collected statistics from ten large London hospitals during the past ten years, and from the facts thus gathered have drawn some interesting deductions as to the prevalence of pyæmia and septicæmia in relation to other diseases, to meteorological conditions, and other influences capable of being regarded as predisposing causes. Broadly distinguishing between septicæmia and pyæmia on the recognized ground of the absence in the one and presence in the other of metastatic suppuration, the committee directed their attention to the subject of artificial septicæmia, with the endeavour to ascertain whether any cases of septic poisoning occurred in the human subject at all comparable to those rapidly fatal examples of blood-poisoning produced by the injection of septic fluids in animals, with which the lectures and experiments of Dr. Sanderson have made us familiar. By a calculation confessedly only approximate the committee believed that instances of this form of septicæmia, which they term "septic intoxication," would require for its production the entrance of as much as two or three ounces of putrid serum into the blood at one time. For so large a dose to be absorbed, not only must there be opportunity for the accumulation of fetid discharge, but there must be a large surface for its absorption. These two conditions obtained in the two cases of septic intoxication they report, and they suggest that had cases of rapid death after ovariectomy been included they would have had more instances of this, the most deadly form of septicæmia, owing to the large absorbing surface presented by the peritoneum. The morbid changes present in this form of septicæmia much resembled those in the more usual form, that known as septic infection without metastatic abscesses—fluidity of blood, subserous hemorrhage, and softening of spleen being the chief of these. So far as could be gathered, the effects of ordinary septicæmia, that of infection from one patient to another, were the same as those produced by the rapid septic intoxication, only spread over a longer interval, but, as Koch first showed, there is an integral difference between them. In all cases of septic infection organisms may be detected in the blood. Twenty-nine cases of septicæmia were detailed in the report, of which only two were instances of septic intoxication. There remained 127 cases of pyæmia, the ordinary significance of the word being used by the committee, who, however, have succeeded in making no fewer than eight subdivisions of this form of blood-poisoning. These subdivisions are based mainly upon the relations of thrombosis and softening clots to secondary abscesses, and upon the situation of these abscesses (*e. g.*, in some cases they were absent from the lungs, in others these organs alone contained them, and so on), whilst pyæmia due to acute necrosis and that due to ulcerative endocarditis each occupy a place apart. One very constant fact is striking, namely, the association of "arthritic pyæmia" with genito-urinary inflammation. This is of interest in connection with gonorrhœal rheumatism, and possibly also with rheumatoid arthritis. Details of the examination of the blood and urine completed this section of the report. It is interesting that in nearly all of the eighteen cases of pyæmia and septicæmia in which the blood was examined, bacteria were found, but by no means in constant

proportion nor in any constant uniformity of size and shape. The committee could not then propound any theories from these observations. They have wisely contented themselves with stating the facts. They could not even trace relations between the different forms described. It does not appear that any "cultivation" of them was followed out. But with the facts before them, they were justified in believing that the presence of these organisms was rather evidence of the existence, than cause of the production, of the symptoms of blood-poisoning. Many considerations naturally arise here, but until the subject can be viewed in all its bearings, until the report is fully before us, it would be out of place to attempt anything like a criticism. The most interesting fact yielded by the analysis of the urine was the diminution in the excretion of inorganic-constituents, chiefly earthly phosphates. It was suggested that this might be due to consumption of these constituents in the blood by these organisms. It was also pointed out that the potash salts were not in excess, as had been theoretically surmised might be the case.

The question before the committee was one of unusual difficulty, and great credit is due to them for having produced so voluminous and so exhaustive a report within the brief space of eighteen months. It will be found when it comes to be published to be the most complete survey of the subject of pyæmia and septicæmia in man that we possess, and it will prove valuable, quite as much for the suggestions it affords for further research as for the new light it has thrown upon the nature of these diseases.—*Lancet*, May 24, 1879.

#### *Typhoid Fever and Periostitis.*

Until the present time the relations between the inflammations of the periosteum and typhoid fever have not been much studied. Knowing that abscesses, myositis, suppurating infarcta of the intestines, etc., are caused by the effect of typhoid fever, why should we not admit that the bones and their covering may be affected like the rest of the tissues in this illness? MERCIER (*Revue Mens.*, January, 1879) has observed this complication in seven cases. It comes on during convalescence, *i. e.*, after five or six weeks of illness, when there is no fever, and the patient begins to get up. The most marked symptom of this periostitis is weakness, which increases, in spite of the good appetite and the normal state of the digestive functions, the tonics, and nourishing food. Generally a member feels at this time heavy, impotent, and benumbed, the leg can hardly sustain the weight of the body, or the movements of the arm and shoulder are limited. The periosteum is swollen and very tender to pressure in some spots. From four to eight days later the patient complains of violent pains; the skin is normal, but the subcutaneous cellular tissue has become œdematous; the periosteum is tumefied, thickens, and grows excessively painful. This tumefaction of the cellular tissue lasts for four or five days, when the symptoms begin to decrease. The pus which has been formed is either reabsorbed or evacuated. In this case the pains cease, and the periosteum remains thick, sometimes the periostitis ends in necrosis of the bone. It is only after these inflammations of the periosteum are entirely over, after the pus has been either reabsorbed or evacuated, that the patient begins to gain flesh and recover his forces, and the illness may be said to be terminated. The etiology of this complication is as yet very obscure, as it seems to come on suddenly, at least apparently so, unless some traumatic affection in some part of the body seems to determine the spot where it will break out later on. So far as the treatment is concerned, the author has found that a blister applied to the tumefied point from the very beginning has proved useful. When the pus has formed, no artificial opening must be made to evacuate it, as this



might give rise to septicæmia; therefore it is better to let the pus either be reabsorbed or spontaneously evacuated.—*London Med. Record*, May 15, 1879.

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*The Influence of Antiseptic Treatment on Injuries of the Head.*

A paper by Prof. ESTLANDER of Helsingfors, published in the first number of the *Nordiskt Medicinskt Arkiv* for 1879, contains valuable testimony to the beneficial influence of the antiseptic treatment. During the eighteen years 1860-1877, three hundred and forty-one cases of injury of the head were admitted into hospital, under his care. He divides these into two series: one, from 1860 to 1869, in which the ordinary treatment was followed; and another, from 1870 to 1877, in which carbolic acid was used. The results are briefly as follows. In the first period, there were one hundred and forty-five cases: viz., simple wound, seventy-nine recoveries and three deaths; wound laying bare the skull, thirty recoveries and seven deaths; wound with fracture of the skull and lesion of the brain, three recoveries and seven deaths; fracture of the base of the skull, four recoveries and four deaths. In the second or antiseptic period, the numbers were: simple wound, ninety-two recoveries and three deaths; wound with exposure of the skull, sixty-six recoveries and one death; fracture of the cranium and injury of the brain, eleven recoveries and two deaths; fracture of the base of the skull, six recoveries and five deaths. Six cases are deducted in the first period and ten in the second, because death occurred too soon after the admission of the patients for the influence of any treatment whatever to be apparent. It will be seen that the difference in favour of the antiseptic treatment is strongly marked in the case of wounds attended with exposure of the skull; the mortality in the first period being seven cases in thirty-seven, or very nearly 19 per cent.; in the second, one in sixty-seven, or about 1.5 per cent. In the cases attended with injury of the brain, the difference is also great: in the first period, three-fourths of the patients died; in the second, about one-sixth (two in thirteen) recovered. These results are more striking, when it is observed that the death-rate in fracture of the base of the skull, where, of course, antiseptic treatment is inapplicable, was very nearly the same in the two periods. Dr. Estlander says that the results of the antiseptic treatment correspond with his experience of injuries of other parts of the body. Before adopting the antiseptic method, he lost sixteen out of thirty-one cases of compound fracture of the bones of the limbs, and six out of ten cases of penetrating wound of the knee; while, since he has used antiseptics, he has had sixty-six cases of compound fracture with nine deaths, and twelve cases of wounded knee with two deaths.—*Brit. Med. Journ.*, May 31, 1879.

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*Salivary Tumour, following the Extirpation of a Tumour of the Parotid Gland.*

At a meeting of the Société de Chirurgie on January 8, 1879, M. MARTINET read the following note on an unique case. A lady aged 28 had for some time suffered from a tumour of the parotid gland. M. Martinet operated upon it, enucleating the tumour, which resembled adenoma. The patient was ordered to maintain complete silence, and to avoid mastication. On the tenth day, thinking she was out of danger, because the wound was cicatrized, she bit into a piece of bread. Immediately her cheek swelled very much, and the tumour reappeared on the same spot as before. M. Martinet, on examining it, found that it was soft and fluctuating. He made an incision, and a few drops of pus and saliva came out of it. On the patient being told to masticate, the tumour formed again. She was again restricted to taking liquid food, and injections of carbolic acid were made into the sac. On the next day the carbolic acid was found to enter the

mouth. It had passed through the ductus stenonianus. On the twentieth day the patient was well, and the wound was closed.

This case seems to be the only one recorded. We must especially notice three points—the sudden formation of the fluctuating tumour, the communication between it and the ductus stenonianus, and, lastly, its rapid healing. This was due to the cessation of the flow of the saliva into the cavity, caused by the obliteration of the opening through which the saliva penetrated into the cavity, the obliteration of the cavity itself, and the ductus having again been opened by the injections, so as to allow the liquid to pass through.—*London Med. Record*, March 15, 1879.

#### *Removal of a Biliary Calculus from the Gall-bladder.*

At a recent meeting of the Clinical Society of London (*Lancet*, May 24, 1879) Mr. THOMAS BRYANT read the note of a case in which a biliary calculus was removed by operation from the gall-bladder, and a cure resulted. The patient, a single woman aged fifty-three, was admitted into Guy's Hospital in July, 1878, with two discharging sinuses of three years' standing, following an abscess, which had been previously forming for two years. At first the sinus was laid open, and pus alone escaped; but, subsequently, as bile flowed in quantities from the wound, an exploratory operation was performed, and at a depth of two inches a biliary calculus an inch long turned out of the gall-bladder. Everything went on well after the operation, and although bile continued to escape from the wound for about two weeks, the parts quite healed in about four months, and the patient left the hospital cured. Mr. Bryant brought the case before the Society as an encouragement to surgeons to apply their art in similar or allied cases, for he was well prepared to support the suggestion of Dr. Thudichum, made twenty years ago, "that gall-stones might be removed from the gall-bladder through the abdominal walls;" and he pointed out that under certain circumstances the operation was justifiable, when the sinuses by their presence were setting up inflammatory and suppurative changes about the gall-bladder, without any obstruction to the bile-ducts, as well as in that more serious class of cases in which the cystic or common bile-duct was obstructed, and dropsy of the gall-bladder, with jaundice, complicated the case, as shown by the cases of Dr. M. Sims and Mr. G. Brown. Mr. HULKE said there could be no doubt as to the propriety of the operation. In the *Mémoires de Chirurgie* for 1706 was an interesting and exhaustive treatise upon these cases, in which the whole question of diagnosis was very carefully gone into, where a similar case to that of Mr. Bryant's was related, and where a clear and nice comparison was made between this operation for the removal of gall-stones and lithotomy.

#### *Renal Cyst mistaken for Ovarian; Extirpation of the Kidney; Recovery.*

The *Hospital Gazette* (March 15, 1879) quotes the following case from *La France Médicale*, No. 99, p. 783. Patient æt. 49, previous history good. Had borne five children to term and two miscarriages. Ten months since she noticed a tumour developing in the left iliac region, which in the last two months had increased rapidly in volume. Patient became emaciated. No albumen in urine. Tumour movable in every direction, 6 by 7 inches in diameter. Fluctuation very perceptible. Diagnosis, ovarian tumour. Operation. On opening abdomen, both ovaries discovered to be healthy. On puncturing the cyst 2½ pints of fluid escaped. Cyst adherent to kidney, which was degenerated in its lower portion. The renal vessels and ureter were tied, and the kidney removed with the cyst; 4 months later recovery complete.

*A Rare Form of Intestinal Obstruction due to Invagination of a Portion of the Small Intestine in the Walls of the Rectum; Gastrotomy; Recovery.*

At a late meeting of the Clinical Society of London (*Brit. Med. Journ.*, Mar. 8, 1879) Mr. EDWARD BELLAMY communicated the notes of this case. The patient was a pale delicate-looking woman, aged 34, of intemperate habits. She was admitted into the Charing Cross Hospital on February 15th, 1879, with all the symptoms of intestinal obstruction. She had passed nothing *per anum* for nine days prior to admission. She had an inguinal rupture on the left side, and had worn a truss, which was left off just prior to the present attack, and the hernial protrusion did not seem to have come down since. She had been subject to obstinate constipation, and on three occasions the retention of fecal matter had given rise to very serious symptoms. These, however, had always been relieved by ordinary means. On admission, a hard swelling was felt in the left iliac fossa, in the region of the inguinal canal and sigmoid flexure. She had intense pain over the lower part of the abdomen, and her eructation smelt stercoraceous. She was placed under the influence of an anæsthetic, and Mr. Bellamy introduced his entire hand into the rectum, and found that he could not get any fingers past the upper part of the rectum, which seemed to be filled up by some protrusion into it and which itself appeared to be constricted. He, however, determined to wait awhile before operating, and to give the patient all chance of treatment prior to doing so. She, however, rapidly became worse, the vomit becoming absolutely stercoraceous. On the evening of the 19th, strict antiseptic precautions being adopted, Mr. Bellamy first made an incision down to the external ring, thinking that perhaps there might be some implication in the canal. On passing his finger into it, he found that this was not the case, but he did find the sigmoid flexure greatly distended. Having enlarged the incision upwards and obliquely outwards, he was enabled to pass the entire hand within the abdominal cavity and feel for the constriction. Thinking it possible that the sigmoid flexure might have been constricted anteriorly by the posterior utero-vesical fold of peritoneum, he felt for it, and found it not only very much developed, but obscuring a knuckle of small intestines which was obviously invaginated in the anterior aspect of the first part of the rectum, and in addition there was what appeared to the touch to be bands of organized lymph, stretching across in the same place, and probably the result of some earlier inflammatory process. (The existence of these bands, and the hypertrophy of the peritoneal fold, would account for the non-reduction of the hernia *per anum*.) Having again introduced his entire right hand into the rectum, Mr. Bellamy pushed the prolapsed mass upwards and towards his left hand, which was in the pelvic cavity, at the same time breaking down the adhesions and gently drawing out the knuckle and small intestine from its invaginated position, and freeing it from the peritoneal fold. Very soon afterwards, flatus was passed, and in a few hours a copious evacuation followed; of course affording immense relief. The patient became very delirious on the fourth day, but the symptoms yielded to morphia and chloral. The wound was treated strictly in accordance with Lister's method, and she had absolutely no bad symptoms till Thursday (26th), when some symptoms of peritonitis occurred. In examining the literature of the subject, the author had been unable to find any case where gastrotomy had been performed for a similar condition, although Lockhart described the form of hernia: but he stated that he had never known operation necessary. It would be concluded, of course, that the cavity of the peritoneum was opened. This was unavoidable from the nature of the adhesions, and the surgeon's examination was made from within its walls.

Mr. Bellamy allowed that the cause of this hernia was inexplicable; the ante-

rior portion of the rectum had given way, the small intestine had got under the meso-rectum, and had then pushed forward under the mucous membrane.

### *Laparotomy with Antiseptic Treatment.*

The *Archiv für Chirurgie*, Band xxiii. Heft 2, contains a report by Professor CZERNY, of Heidelberg, on a series of cases in which laparotomy was performed, with an endeavour, in each instance, to maintain, during and after the operation, an antiseptic condition of the wounded parts. A full description is given of the details of the treatment carried out in these cases, which details differ somewhat from those observed by Lister. Professor Czerny, though holding by carbolic acid as an antiseptic superior both to thymol and to salicylic acid, regards it as a double-edged weapon, which should be used with much caution, and especially when the surgeon is dealing with an extensive serous surface. The operating room, after fumigation with sulphur, should be well heated. As soon as the patient has passed under the influence of chloroform, the surfaces of the abdominal walls and of the genitals are well washed and disinfected with a 2½ per cent. solution of carbolic acid. The seat of the operation is then surrounded by compresses dipped in this solution, and at the same time, in order to prevent eczema through prolonged contact from the accumulated fluid of the spray, the back and sacral region are oiled and covered by layers of wadding. The instruments, for some time before they are used, are kept in the 2½ per cent. solution. For sutures the author uses silk boiled on the previous day during ten minutes in a 5 per cent. solution of carbolic acid, and then kept until required for use in a 2 per cent. solution. Silk thus treated is used also for ligatures. The two ends are cut off, and when the wound heals quickly and without suppuration, no irritation is set up by the presence of the noose in the soft parts. The silk ligature remains encapsuled within the tissues, and is not absorbed, as catgut is, which, in some operations, as the radical treatment of hernia and the deligation of an ovarian pedicle, may, according to Professor Czerny, be considered as an advantage. The sponges, having previously been disinfected in a stronger fluid, are placed, on the morning before the operation, in a 2 per cent. solution of carbolic acid. The wound, after the operation, is covered by Lister's dressing, and thick layers of "salicylic wadding," and, over all, a firmly constricting bandage. Compression of the abdomen is regarded as an important detail of the after-treatment, since by this means accumulation within the peritoneal cavity of putrescible exudation may be prevented. In one case only has the author hitherto practised prophylactic drainage of the abdomen in performing laparotomy.

Professor Czerny has practised abdominal section with the above described antiseptic dressings in ten cases. Of these ten operations, six were for ovariectomy, two for hysterotomy, one an incision in a case of suppurative peritonitis, and one an exploration in a case of doubtful abdominal tumour. In one only of these, and that an ovariectomy, was the result fatal.

In two of the instances of ovariectomy, both for cystoma of the ovary, the operation was attended with much difficulty, in consequence of adhesions, and it was found necessary to apply many ligatures. In one of these cases both ovaries were removed. In the second case a long and thick pedicle was first touched with the actual cautery, and subsequently, on account of renewed hemorrhage, constricted by several ligatures. In all the other cases of ovariectomy the pedicle was dealt with only by ligatures. In one case the operation was very easy, since, notwithstanding a previous electrolytic treatment of some activity and duration, no adhesions had formed. The fourth case terminated fatally, though it had presented the most favourable prognosis before and during the operation. On the fourteenth day, when the abdominal wound had closed without any signs

of local reaction or any general affection, save a slight attack of intermittent fever, the patient suddenly became collapsed, and complained of severe abdominal pain. The case was then diagnosed as one of septic peritonitis, and treated by drainage of the peritoneal cavity and injections of thymol-water. After an interval of eight days, during which the patient had been much relieved and the prospects of recovery had been good, death resulted from acute pulmonary congestion, and a second sudden fit of collapse. At the autopsy a large abscess was found between the uterus and the rectum. In two of those cases of ovariectomy the fever after the operation was high, in two others it was slight, and in the remaining two cases there was no rise of temperature.

In the two operations for hysterectomy performed in cases of multiple parietal fibromata exciting profuse hemorrhage, much difficulty was experienced in maintaining an antiseptic condition of the seat of operation, in consequence of an extra-peritoneal treatment of the pedicle, and of the necessity of using for this purpose large and complicated apparatus. In one case a chain *écraseur* was used, and in the other two long needles. In the former case, in which both ovaries were removed, the operation was followed by thrombosis of the left femoral vein, and high fever. In the second case there was but slight rise of temperature. Although in both these instances of laparotomy the antiseptic treatment was so imperfect that the wounded parts could not be well protected from the contact of disinfected air, and extensive necrosis of the pedicle occurred, still decomposition of the exuded fluids was much retarded, and bad smell avoided.

In the ninth case, a large swelling, with a tough and fibrous exterior resembling the wall of a cyst, was exposed during an operation for the removal of a supposed ovarian tumour. On incision of the wall of this swelling, a large quantity of sero-purulent fluid was discharged from a cavity which was bounded above by the stomach and spleen, below by the uterus and bladder, and behind by a mass of united coils of small intestine. The surfaces of all the abdominal viscera were covered by thick and tough exudation. Four large drainage tubes were inserted into the sac of the abscess, and the external wound was dressed antiseptically. Some slight decomposition of the purulent secretion occurred in spite of this treatment, but there was very little fever during the subsequent progress of this case, and the patient ultimately made a good recovery.

The last case was one of a small abdominal tumour in a man who was the subject of right-sided cryptorchism. The growth, which lay in front of the spine, was so very painful that the patient eagerly demanded some operative means of relief. The tumour was diagnosed as being either a degenerated sarcoma of the retained testis, or sarcoma of a mesenteric gland. On exposure of the growth through abdominal section, it was found to be of the size of an ostrich's egg, and presented a white and fibrous external coat resembling the tunica albuginea. It was firmly bound down to the spine and over the aorta by very tough and vascular connective tissue, and over the front of the tumour coursed the flattened ureter from the right kidney. An attempt was made, but without success, to detach this tumour. The patient made a good recovery after the operation, and was much relieved through the cessation of pain in the growth.

Professor Czerny points out that the general results in these ten cases were favourable, although in four he failed to prevent inflammatory irritation and decomposition in exuded fluid. Fever, which is usually very high after abdominal section, was very slight in four of the cases, and altogether absent in three cases. In not a single instance were any symptoms observed of primary septic peritonitis. The hygienic condition of the hospital in which these operations were performed is reported to be very good, but still the results, from their exceptionally favourable character, have convinced Professor Czerny of the importance

of always relying on antiseptic measures in the performance of laparotomy, and during the after-treatment of the external wound.—*London Med. Record*, April 15, 1879.

*Acute Intestinal Obstruction; Laparotomy; Removal of large Impacted Gall-Stone from Ileum; Death from Peritonitis.*

At a late meeting of the Clinical Society of London (*Brit. Med. Journ.*, Mar. 8, 1879) Mr. THOMAS BRYANT read the notes of this case, which was one of a lady who had been in good health, having no symptoms of disease, except indigestion from time to time. On August 8th, she went to bed in health, and awoke at 12 o'clock with sickness and severe abdominal pains. She was thought to be suffering from a bilious attack, but the symptoms persisted. The attacks of pain became more and more frequent, and the vomit first foliaceous, then stercoraceous. During the exacerbations of pain, she writhed in agony. The abdomen was everywhere tympanitic and tender; but the centre of distress seemed to be on the left of the umbilicus. The countenance was anxious, and pulse feeble; there was no external hernia. The diagnosis was that of acute intestinal obstruction, and pointed to a band, or twist, on an internal hernia; but there was no history to confirm any particular view. It being evident that death must ensue without surgical interference, laparotomy was proposed. *Operation.*—A downward incision, four inches long, was made in the central line of the abdomen, commencing at the umbilicus; blood-stained serum escaped, and the small intestines were found to be ecchymosed. The coils of intestine were followed, and a hard ovoid body was found impacted in, or rather grasped by, the intestine. The body, which proved to be a gall-stone (exhibited before the Society), was removed; the wound in the intestine was stitched with carbolized catgut, and the bowel returned. The patient never rallied from the collapse, but sank in eight hours. At the *post-mortem* examination no extravasation from the wound in the intestine had taken place. On the contrary, it was well sealed with lymph. There was advanced peritonitis. The point of impaction was in the ileum, one foot above the ileo-cæcal valve; the gall-bladder was a thickened pouch, about the size of a walnut; the duodenum was adherent to it, and their cavities were continuous. The gall-stone removed weighed 238 grains, and measured  $1\frac{7}{8}$  inches in length,  $1\frac{1}{8}$  inches in breadth, and  $3\frac{1}{4}$  inches in circumference. Mr. Bryant remarked that the gall-stone must have made its way into the duodenum by ulceration, without any symptoms, more than could be attributed to indigestion. He commented upon the advisability of not delaying operative interference in cases of recognized intestinal obstruction, and mentioned that probably success did not follow the operation in question because it was performed at too late a period; seventy-two hours of acute obstruction, together with mechanical injury of the calculus, giving rise to acute peritonitis, which rendered success almost impossible.

*Double Perforation of Intestine successfully treated by Catgut Suture.*

Dr. RIEDINGER, of Würzburg, relates the following case in the *Centralblatt für Chirurgie*, No. 10, 1879. In operating for strangulated inguinal hernia on a man aged 35, a large quantity of fluid having an offensive smell escaped from the sac; and, on examining the intestine, which was much injected, and of dark brown and in some parts black appearance, two rather large ruptures were found in the posterior part of the loop. After removal of the sloughing edges, these were united by a series of catgut sutures placed close together. The united wounds lay parallel with the long axis of the gut. Care was taken to bring the serous surfaces into intimate contact; the sutures were carried through the entire thick-

ness of the bowel. The intestine was replaced, and Listerian dressing applied, a drainage-tube being inserted. Healing took place in a short time, without febrile disturbance.—*British Med. Journal*, April 19, 1879, from *Deutsche Medicin. Wochenschrift*, March 1st.

*The Cure of Hemorrhoids by the Hypodermic Injection of Carbolic Acid.*

MR. EDMUND ANDREWS, Professor of Surgery in the Chicago Medical College, has recently made (*Chicago Med. Journal*, May, 1879) a laborious inquiry into the results of over 3300 cases treated by this method, reported to him by about 300 physicians. From a study of these cases he deduces the belief that, if the following rules be observed, the method of treatment by hypodermic injection will be less painful than any other, and equally safe:—

1. Inject only internal piles.
2. Use diluted forms of the remedy at first, and stronger ones only when these fail.
3. Treat one pile at a time, and allow from four to ten days between the operations.
4. Inject from one to six drops, having smeared the membranes with cosmoline to guard against dripping. Inject very slowly and keep the pipe in place a few moments to allow the fluid to become fixed in the tissues.
5. Confine the patient to bed the first day, and also subsequently if any severe symptoms appear. Prohibit any but very moderate exercise during the treatment.

His final conclusion is that this mode of treatment is a valuable contribution to scientific knowledge, and that the cautious injection of hemorrhoids with carbolized solutions will remain as one of the permanent operations of surgery. The operation is to be performed in the following way: The pile is exposed to view, and the anus smeared with an ointment to prevent smarting in case the fluid should chance to drop. The operator then takes a sharp-pointed hypodermic syringe, charged with the carbolized liquid (which has been used in varying strength from one part of the crystallized carbolic acid to thirty of olive oil or glycerine up to equal parts), and slowly throws a few drops into one of the piles. The pipe is left in the puncture a few moments to prevent the fluid from running out, and to allow it to become fixed in the tissue. The pile turns white, and in the most successful cases withers away without pain, suppuration, or sloughing. Only one pile is treated at a time, and about a week is allowed between the sessions, until all are cured. Most of the cases thus operated upon suffer a sharp temporary smarting, and a few have a terrible and prolonged agony. The majority are cured, however, without interrupting the patient's business.

*Symptoms and Treatment of Cystitis of the Neck of the Bladder.*

LAFOREST, after having carefully studied the different forms of cystitis of the neck of the bladder and their symptoms, sums up his results as follows. (*Thèse de Paris*, 1878; and *Bull. Général de Thérap.*, March 15, 1879.)

There are three different forms of cystitis of the vesical sphincters, according to the symptoms. They arise from different causes, and must be treated in different ways. The first form, which is most frequently met with, is comparatively the least troublesome one. It generally lasts from forty to sixty days, and is called "subacute cystitis of the neck." The treatment consists in most cases of simple therapeutical means, though the use of soft bogies will prove very efficient towards hastening the recovery of the patient. A second form of the affection is apt to cause much pain and trouble, owing to frequent attacks of spasms

and contractions, which give rise to alternate fits of retention and incontinence of urine; while, at the same time, the desire to micturate becomes so frequent, as to cause the patient serious inconvenience, and disturb his rest. This affection lasts generally from six weeks to several months; the author has given it the name of "chronic cystitis, complicated with spasms and contractions." Owing to the fact that it is always brought on by inflammation, this form of cystitis may easily be cured during its earlier stages, but a purely medical treatment will hardly prove efficient enough alone, unless combined with surgical treatment. According to the severity of the case, either progressive dilatation or divulsion, or a local application of nitrate of silver, or even internal urethrotomy, may be successful. The third class has been simply named "rheumatic or nervous cystitis," as its etiology is very clear; neither urethritis nor blenorragia are present, only a purely rheumatic diathesis. Its duration is from three to six months, but cases have come under observation where it lasted for years; and, finally, ended fatally. The treatment must be a very energetic one; it generally consists in divulsion, internal urethrotomy, and even median lithotomy.—*London Med. Record*, May 15, 1879.

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*Deligation for Aortic Aneurism of the Right Carotid and Subclavian Arteries,  
with a new species of Ligature.*

At a recent meeting of the Royal Medical and Chirurgical Society (*Lancet*, May 31, 1879) Mr. RICHARD BARWELL read a paper on this subject, of which the following is an abstract.

Mr. Barwell reminded the Society that he has already recorded four cases of double ligature of these vessels, three of which were successful, and pointed out that the same operation was in the present case undertaken not for innominate but for aortic aneurism. As this practice and the ligature used are new to surgery, somewhat lengthy remarks would be necessary, hence the case must be briefly recorded. John S., aged thirty-six, gray and old for his years, was treated by Dr. Green for an aneurism of the aorta which pressed upon the right bronchus, and by the middle of February, six weeks after admission into Charing Cross Hospital, that tube was very nearly closed, and the right lung occluded from the air. On the 15th of February Mr. Barwell tied the right carotid and subclavian arteries with immediate sense of benefit to the patient, who continued to improve, air entering the lung freely until the end of March, when some private news produced great excitement, and shortly afterwards symptoms of dilated aorta about the origin of the left subclavian appeared. These again diminished, so that in the first week of May the man was in a far better state—air entering the right lung—although some disease of that organ had been produced by the previous pressure.

*Remarks.*—The three large branches of the transverse aorta are not given off at right angles to the trunk, but so obliquely that the distal margin of the orifice of each lies lower than the proximal; from this distal margin run downward and to the right certain ridges which, acting on the blood-stream, divert the current at that part into each orifice. These ridges divide the upper aspect and a portion of the antero-posterior wall into districts, one for each vessel. A fibrous concretion detached from an aortic valve finds its way, as a rule, into the left carotid—a fact which has given rise to the idea that this vessel lies more in a straight line with the aorta than the right. Mr. Barwell showed the contrary to be the fact—that a probe passed down the left vessel impinges on the aorta near its origin, and that one passed down the right artery enters the heart. He concludes that we can only account for concretions going to the left carotid by believing that on the right of the ascending aorta (the exact part was shown in



diagram) the blood current is more tranquil than on the left of that vessel; the two currents may be supposed separated by a line drawn from the left carotid orifice to the outer aspect of the origin of the aorta. Hence it may be concluded that for aortic aneurisms amenable to operative treatment those that can be diagnosed as arising to the right of this line must be treated by tying the right vessels, those on the left by deligation of the left carotid. The ligature used has been the subject of much care and experiment. Catgut has been shown to be unreliable for tying vessels in continuity; it does not appear that this depends on the method or period of soaking in carbolized oil. The author attributes its defects to the method of manufacturing the catgut itself. Putrefaction in water enters largely into this process; different parts will have suffered in various degrees from putrefaction. But more objectionable even than this is the shape of the ligature, for it is difficult, perhaps impossible, to avoid dividing the inner coats of vessels tied with a round cord. Now, it is this division of the vascular coats that exposes patients to the dangers of secondary hemorrhage, which has been the cause of death in almost every case hitherto recorded of tying the innominate or first part of the subclavian. An organizable ligature, which, being flat, does not divide the arterial coats, ought to secure surgery against this danger. After many experiments the author hit on the idea of using the middle coat of oxen's aorta, which, being quite fresh, is to be prepared by separating it from the outer coat and by cutting it spirally, thus making long flat tape-like ligatures, which are dried under suspension by a weight to remove superabundant elasticity. Just before use they are moistened to restore flexibility. Before attempting operative surgery with this material it was tested experimentally in various ways, and in the case recorded its action left nothing to be desired. If the anatomical and physiological views propounded in the first part of this paper are correct, a precision, as yet wanting, will have been given to operative procedures in cases of aneurism, while by the new ligature a degree of safety hitherto unattained will have been imparted to the operations themselves. At the conclusion of the paper Mr. Barwell exhibited specimens of the ligatures described therein.

Mr. ERICHSEN said Mr. Barwell's case presented many points of importance in surgery and in medicine. It was the first case in which the treatment had been adopted knowingly for aortic aneurism, for in the first case in which the carotid and subclavian were tied an aneurism of the aorta was thought to be innominate, and the ligature was applied under that mistake. But Mr. Barwell's case raised a new principle in the treatment of aneurism, for it was a different thing to tie the carotid and subclavian for innominate than for aortic aneurism. In the former some effect might be produced, but it was difficult to see how, in the latter case (when the whole length of the innominate lies between the seat of ligature and the aorta), the stream in the aorta could be affected. If any effect were at all produced it would be to augment the volume and force of the blood sweeping through the aorta. As to the other operation for aortic aneurism—viz., ligature of the left carotid—there have been cases fairly successful; but he had thought that sometimes the occlusion of the carotid was rather the effect of commencing consolidation of the clot in the aneurism than the cause of this. Further, he urged extreme caution on the part of surgeons in resorting to ligature for aortic aneurism. Cases had failed, and in them disease of the heart or extensive disease of the aorta was present; so that, looking to the extreme difficulty of diagnosis, the fact that by medical treatment life may be prolonged for many years, and the risks entailed by operation, he would hesitate much before assenting to the proposition that ligature of the large vessels at the root of the neck was an advance in the treatment of aortic aneurism.

Dr. GREEN said the diagnosis of aortic aneurism in the case related by Mr.

Barwell was beyond doubt; but he could not pretend to say how far it involved the innominate. The man was treated by rest, restricted diet, and iodide of potassium in large doses; but in spite of all the pressure symptoms increased. These symptoms were chiefly those of pressure on the right bronchus, so that the air entered the right lung very imperfectly. Dr. Green then passed the case over to Mr. Barwell, and he was astonished to see the marked improvement that took place in a few days after the operation—the pain and dyspnoea ceased, and the lung expanded more freely. Still it was probable that the aneurism would again increase. He thought that during the last week or two pulsation had increased.

Mr. HOLMES said that all must concede the difficulties there are in the diagnosis of these cases, and the inadvisability of resorting to such radical measures as ligature of the subclavian and carotid until a fair attempt had been made to treat the case medically. But there was no doubt that surgical interference had saved patients from apparently imminent death. In the case of the young girl on whom he had operated there was no question as to her desperate condition. She had been treated for a long time medically. It is now four years since the operation, and she is still in moderately good health. Still, he confessed to not being clear as to the precise part of the aorta involved, and did not think Mr. Barwell had clearly shown how the distinction could be made during life between an aneurism springing from the right and one from the left side of the aorta. In the case described the evidence was certainly strong in favour of its springing from the right half of the aorta, whilst the want of any difference between the radial pulses excluded the idea of its being an innominate aneurism. His own rule was to delay operative interference until, by its extension up the neck, the aneurism threatened life by pressure on the air-passages. He still adhered to the opinion, opposed to that of Wardrop, that the effect of tying the third part of the subclavian is to increase the circulation through the first part and to cause the enlargement of the collaterals. He asked what proof Mr. Barwell had in favour of the view that obliteration of the first part of the subclavian followed on ligature of the third part. But he believed that the great benefit results from coagulum extending along the carotid into the sac of the aneurism. Speaking of the new form of ligature, Mr. Holmes hoped that it would be found to answer its purpose, which was the same as that had in view by John Hunter when he tied the femoral artery by flat tapes in order not to divide the coats. In order to be efficient, the ligature should undergo no change for a long time—a year or so. If Mr. Barwell could promise this, then he (Mr. Holmes) for one would never attempt to divide the internal and middle coats of the vessel. It was the insecurity of catgut, its rapid absorption, that made it absolutely necessary to divide the coats in using the ligature. He confessed there was not the slightest evidence in favour of the organization of catgut ligatures. If Mr. Barwell's ligatures would organize, they would be very valuable indeed.

Mr. BARWELL in reply, said that the "new principle" of his operation was really involved in the considerations advanced by Dr. Cockle, in favour of ligature of the left carotid for aortic aneurism. The question was not settled. The cases already on record show that a certain influence for good is produced in the aortic current by deligation of vessels at the root of the neck. Mr. Heath's case, Dr. Holmes's case, and his own former case, where life was prolonged for ten weeks, were instances of this; and although it was true that in Mr. Heath's case the deligation was practised under an error in diagnosis, he (Mr. Barwell) doubted if it would have got well had the left and not the right vessels been tied. Was it possible to distinguish those cases in which deligation should have a curative effect and those in which it should not be curative? And then could we distinguish between those cases in which the right carotid should be tied and those in which the

left? In cases such as the one read that night the position of the aneurism was not doubtful, and by a careful study of previous symptoms, sphygmography, etc., a clear diagnosis may often be carried out. He agreed with Mr. Holmes, that encroachment of the aneurism on the respiratory organs should be taken as an indication for operation. He would not tie rashly nor inconsiderately, and would, if possible, try to get a clear idea of the position of the aneurism; nor would he operate until medical measures had been exhausted. As to the ligature, he hoped it would prove efficient. As long as it remained around the wound, so as to occlude it until the coagulum had become firmly adherent to the walls of the vessel, it would fully serve its purpose. He differed entirely from Mr. Holmes in his criticism upon the effect produced on the first part of the subclavian by ligature of the third part. In one of his previous cases the subclavian became completely obliterated; whilst in his lectures Mr. Holmes gives eleven cases in which the carotid only was tied and the subclavian left, all of whom died from increase of the aneurism, due as he (Mr. Barwell) believed, to the continued flow of blood through the innominate.

#### *Electrolytic Treatment of Aneurisms of the Aorta.*

At the meeting of the Académie de Médecine on January 21, 1879, Dr. Bucquoy communicated the following interesting observation. The patient was a woman aged 58 years, in whom an aneurism of the ascending aorta had suddenly developed itself. Two years later, pulsations could be detected in the tumour, which bulged out considerably on the right side of the thorax, and spread over the second, third, and fourth intercostals, completely covering the ribs and their cartilage, so that they could no longer be felt. Seeing the eccentric and lateral position of the aneurism, and urged by the impending peril, M. Bucquoy resolved to try Ciniselli's electrolytic treatment for aneurisms. The first sitting took place on the 12th of June, 1878. Dr. Dujardin Beaumetz assisted, and the operation was carried out according to his modified proceeding. Two needles were plunged into the most prominent parts of the tumour to the length of two and a half centimetres, and brought alternately into contact during five minutes, with the positive pole of a Gaiffe's pile, the negative pole of which was applied to the patient's thigh. The current was allowed to pass through her body for about twenty minutes. During the operation she complained of very violent pains, which were followed by an inflammatory tension of the tumour, making the latter very painful to pressure. But at the same time the general and functional troubles were lessened, the dyspnoea had decreased, and the patient could sleep. A fortnight later, a second sitting was followed by the same phenomena, but the tumor collapsed markedly. After three more operations it had almost become solid, and the patient was well enough to leave the hospital and return to her work. Two months later, she again presented herself, complaining of a general feeling of lassitude, and of shortness of breath. The aneurismal sac again increased in size, but was not nearly as large as when first seen. Four more sittings were then held, and finally succeeded in reducing the aneurism to its present state. The bag has collapsed, and forms a hard lump, which does not give way under pressure, and is of a fibrous consistency. At the upper end there is a small pointed prominence of the size of a small nut, which pulsates very strongly. The cure is not complete, but there is no doubt as to the possibility of completing it. M. Bucquoy concludes from this and many other cases that electrolytic treatment may prove extremely useful in cases of sacciform aneurisms, adherent to one portion of the coat of the aorta only.—*London Med. Record*, May 15, 1879.

*Resection of the Elbow for Ankylosis.*

In an able essay in the *Revue Mensuelle de Méd. et de Chir.*, bearing that stamp of sound judgment and wide experience and research which we should expect from this author, M. OLLIER makes several propositions, which put the question of resection of the elbow-joint in a wholly new light, deserving the attention of all surgeons. The entire subject is handled at considerable length, anatomically, clinically, and historically, and with great care, but his practical conclusions may be briefly summarized as follows.

He admits that the grounds upon which we usually resect the elbow-joint for disease are sound, viz., to put an end to long and wasting suppuration, etc. But he goes further, and advocates the operation in all cases where ankylosis is imminent. He enters a protest against the generally received idea "that ankylosis at a right or slightly obtuse angle after grave arthritis of the elbow should be regarded as a fortunate result, which it is proper to respect." This result should, he says, be forestalled, and "whether the arthritis be cured or not, one is justified in resecting with the one aim in view of restoring the movements of the joint if the subject is in a condition as regards age, social position, etc., which render the operation certain in its results and necessary."

But, again, if an existing ankylosis is bilateral, the operation is indisputably called for, no matter at what angle it has taken place; also if unilateral, when the subject is young and likely to be much troubled in his occupation by the loss of motion of the joint.

The author regards himself as justified in these conclusions by a careful study of the results of recorded cases, and by the success of his own operations, which are described in detail in the paper before us. But he guards himself in thus advocating very free operation. He remarks very truly that "before undertaking a resection of the elbow for ankylosis we must examine and know the conditions which experiment has shown to be necessary for the establishment of a new articulation." These he points out in his paper. We have two great dangers to avoid: in young persons a return of the ankylosis, in adults undue mobility of the new joint, calling in each case for an intelligent modification of the operative procedure. He recommends the subperiosteal method, but, if so, a zone of periosteum corresponding to the line of the new joint must be removed, so that there shall be a break in the new bone formed, and ankylosis may thus be prevented. The bones should first be separated with chisel and mallet if ossified too firmly to be broken with the hand. Mere removal of a cuneiform portion of bone at the joint will not answer: a complete resection must be performed. And even so in young subjects it requires the greatest care to prevent ankylosis returning.

Finally, in the subsequent treatment of the case, the surfaces of section must be kept apart to a degree proportionate to the tendency to ankylosis depending on the youth of the subject, etc. Other things being equal, they will be brought nearer together, the farther the individual has passed the period at which osseous development ceases.—*London Med. Record*, March 15, 1879.

*Amputation at the Hip-joint; Iliac Arteries Compressed by Lever.*

At a recent meeting of the Clinical Society of London (*Lancet*, April 26, 1879) Mr. A. PEARCE GOULD read notes of a case of amputation at the hip-joint, in which the iliac arteries were compressed by Davy's lever. The patient, a man aged twenty-eight, was admitted into Westminster Hospital with advanced disease of the hip. Excision of the head of the femur, which was separated from the neck, was performed, but it became necessary to remove the limb.

Mr. Gould did this by prolonging his excision wound downwards a short distance, and then severing the thigh circularly—an oval amputation in fact. He claimed for this method that it considerably lessened the extent of the cut surface, and the uninjured inner part of the thigh was very useful in supporting the posterior flap, and in aiding the nutrition of the flaps. He recommended it especially in cases of amputation following excision. The iliac vessels were controlled by Davy's lever passed into the rectum. There was no flow of blood during the amputation, only that lying in the severed vessels escaping. At the end of the operation the blood in the tray, mixed with serum and sawdust, measured less than three ounces. In comparing Davy's lever with Pancoast's tourniquet, which is usually employed, Mr. Gould held that it had the following advantages: 1, it disturbed the circulation less; 2, it did not interfere with the respiratory movements, nor was it interfered with by them; 3, its use was not prevented by obesity, rigidity of the abdominal walls, or the existence of abdominal tumours; 4, the pressure required was less; 5, less liability to injury of viscera and peritoneum; 6, greater ease and security in application; 7, greater cheapness and durability; 8, if the lever were not at hand, its place could be more easily supplied. The lever was first suggested and used by Mr. R. Davy, in a young child, in January, 1877; then by Mr. Gould, in December, 1878, and since then by Mr. H. Marsh, Mr. Armstrong, Mr. Davy, and Mr. Cadge, and in every case successfully. Mr. Gould showed some deep sutures which he had employed to maintain the flaps in exact apposition. They were steel pins riveted at one end to a flat oval disk of vulcanite; this pin is passed through the flaps up to the disk, and then a smaller disk of pure black rubber is slipped down over the pin to the other flap; by its elasticity it grips the pin. Three of them were used, and held the flaps so firmly that the patient was able to turn in bed and move his stump without assistance. The patient progressed very favourably for forty hours, but died at the end of sixty-eight hours, and at the autopsy all the veins of the left foot, leg, and thigh were found to be filled with black coagulum, which reached just into the common iliac vein. There was no sign of injury of the rectum, peritoneum, or arteries.

Mr. MACNAMARA said this was the second case in which he had seen Mr. Davy's method employed—the first being an anæmic child in whom amputation was performed for hip disease. No more than an ounce and a half of blood was lost, and the child did well. Still, the method required great care on the part of the assistant; and the length of the lever from the artery rendered the compression somewhat uncertain. It might injure the rectum, especially in a child. For these reasons he had advised Mr. Gould not to use it, but the result falsified his fears. A few days after he asked Mr. Davy to demonstrate the procedure on the dead subject; and, as it happened, it was found that the lever could not be passed into the rectum of that case. So that it was quite possible it might sometimes fail. At any rates, the condition of the bowel should be first ascertained.

Mr. MARSH had lately assisted Mr. Young, of Sevenoaks, in an amputation for hip disease, he (Mr. Marsh) having charge of the compressor. He found no difficulty in introducing the rod nor in compressing the vessel, and during the amputation very little blood was lost. The plan was worthy of a careful trial, for Lister's tourniquet had its defects, especially if the patient be in a low condition. A short time ago he amputated the thigh high up for secondary hemorrhage, and, not daring to put on Lister's tourniquet, the artery had to be compressed digitally. The patient died, losing more blood from the operation than he could afford. The lever may be useful in the treatment of femoral or iliac aneurism.

Mr. FURNEAUX JORDAN had no experience of Mr. Davy's lever, which seemed

to be a useful and simple addition to surgical appliances. He had recently recorded in the *Lancet* a method of amputation at the hip-joint by enucleation of the femur, separating soft parts nearly to the knee-joint, then dividing the thigh at its lower part. In that way a large amount of tissue was preserved, and greater safety insured. Only three days ago he had performed this operation a second time, the case being one of rapidly-spreading gangrene. The case was doing fairly well. He had also heard that at the General Hospital, Nottingham, both Mr. Littlewood and Mr. Baddard had performed the operation, giving a series of four successful cases by this method.

Mr. M. BAKER inquired whether in Mr. Gould's case the thrombosis was due to the compression of the iliac vein by the lever. He had found no difficulty in the use of Lister's tourniquet in a case of amputation at the hip; and in two other cases at the Evelina Hospital, where the operation was performed for hip disease, there was no difficulty in compressing the abdominal aorta. In these cases it would not have been necessary to use Davy's lever. Mr. Jordan's method might be of service with reference to antiseptics, but the time it must take would surely favour the production of shock sooner than by a more rapid method. He had recently heard of a case where an hour and a half was occupied in the operation.

Mr. HEATH had assisted Mr. Swayne, of Devonport, in an amputation of the same kind as that subsequently performed by Mr. Lee. The case was one in which the head of the femur had been previously excised; but such cases belonged to a different category from those where a tumour had to be dealt with; and it was *these* cases which were so fatal. Mr. Jordan's method might be described as an elongation of Mr. Lee's. The difficulty experienced in passing the lever in a subject after death might not obtain in the living body, the condition of the rectum being so different in the two cases.

Mr. HOWSE said that in amputation of the hip the choice lay between digital compression of the iliac artery and its compression by Mr. Davy's method; and he could welcome any device by which the great strain of compressing the artery digitally might be avoided. Mr. Jordan's method, although applicable to cases of amputation after excision, was, as Mr. Heath had said, far less feasible when tumours were concerned than when the head of the femur was *in situ*. In such cases too much time would be required for the operation. Then it was essential to remove all sinus-tissue, which formed so great a factor in the after-history of the patient, for if it were left, lardaceous disease might subsequently develop. In all his cases he had made flaps of skin only.

Mr. F. JORDAN said that in no case had the operation by the method he had described taken more than four or five minutes to accomplish.

Mr. G. BROWN asked what was the cause of the thrombosis. It seemed reasonable to attribute it to the absorption of carbolic acid. If produced by the pressure of the lever, the clotting would have occurred on the opposite side.

Mr. HULKE, in calling on Mr. Gould to reply, said that the discussion had been gratifying. The oval operation was a favourite one of Guthrie's, and he had helped Charles Guthrie to do it in 1849 or 1850, making an external and internal skin flap, and cutting the muscles short. In military surgery this form of stump was very preferable to a heavy flap in cases where the wounded required removal. The disadvantages attributed to Lister's tourniquet had followed its prolonged use, and not when it was applied only for a short time. The lever should not be advocated unfairly.

Mr. GOULD, in reply, said he believed there was a stricture of the rectum in the case which Mr. Macnamara had referred to. The lever had been once used for aneurism, but only for twenty minutes. In his case there was no sign of

injury to the vessels discovered after death. He attributed the thrombosis to carbolic-acid poisoning.

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*Sutural Junction of a Divided Ulnar Nerve.*

At a recent meeting of the Clinical Society of London (*Lancet*, May 24, 1879) Mr. HULKE read the notes of a case of sutural junction of the ulnar nerve fifteen weeks after its complete severance by a roofing-slate; early restoration of function. He said the procedure was a rare one, but where practised had already given most satisfactory results, and held out promise of restoration to many an otherwise crippled limb. This case was interesting from the long interval that elapsed after the injury before the operation was performed, and from the speedy restoration of commencing nerve function, which was only three or four weeks after the operation. The patient, a blacksmith, aged fifty-three, was struck across the inner side and front of elbow by a slate dislodged from a roof. The wound thereby produced healed slowly, and was painful from the first, the pain assuming a neuralgic character. The forearm and arm wasted; the man's health suffered, and he was quite unable to do any work. Fifteen weeks afterwards all parts supplied by the ulnar nerve in the hand were numbed and cold, and the scar in front of the elbow was exquisitely tender. The patient was then chloroformed, and an Esmarch's bandage put on. The ulnar nerve was exposed at the elbow, and found to be completely divided, and the two ends widely separated. The upper end was bulbous, and was dragged out of its course by the cicatrix; the lower end was shrivelled. In both ends were minute particles of slate embedded. Both ends were removed by clean transverse sections, and were then found to be three-quarters of an inch apart. In order to bring them together the upper end was stretched and drawn down, and joined as closely as possible to the lower one by four silk sutures passed through the sheath. Absolute contact was not obtainable. The operation was done, and the wound afterwards dressed antiseptically. The neuralgia ceased at once, and did not recur, and in less than six weeks the patient returned home. Sensation, which had begun to return about a month after the operation, rapidly increased, so that upon leaving the hospital the man went at once to his work.

Mr. MARSH said that two days ago Mr. Savory had operated on a similar case, where the ulnar nerve had been divided at the elbow, almost as in Mr. Hulke's case, but catgut sutures were used, and he did not think the upper end was stretched. Mr. Marsh also referred to Mr. Wheelhouse's case of suture of the sciatic nerve, where function was restored to a completely palsied limb. Such cases showed the great advances of surgery, for he remembered ten years ago, at the Children's Hospital, the case of a child whose lower limb was perfectly paralyzed from a deep wound in the thigh, but where no operation was entertained.

Dr. ALTHAUS observed that the length of time which had elapsed from the date of injury showed what might be done by surgery. Physiological experiments had shown that if two ends of a severed nerve be approximated to within a quarter of an inch there would be perfect reunion; but if a longer interval were left then union only took place by fibrous tissue. In cases of simple division without excision of a part of the nerve union took place in from seven to ten days; if a small part were excised, union was delayed for two, three, or even four weeks. Hitherto a large number of cases of nerve-injury had been looked on as incurable.

Mr. HEATH asked Mr. Hulke whether observations upon the return of sensation were made especially on the ring finger; for it was stated that after division of a nerve there may be a reverse current by means of anastomotic filaments with neighbouring nerves—in this case the median. Some years ago, in laying open some sinuses about the elbow, he divided accidentally the ulnar nerve, but im-

mediately united the ends by a single stitch put through the centre of the nerve. The suture was not seen again, it excited no pain; and the patient recovered power, but not completely. At the time he had dreaded lest the presence of the thread in the nerve might produce tetanus.

Mr. G. BROWN said that Mr. Wheelhouse's case was remarkable because the operation was done so long after the injury—two years he thought—and the separation between the divided ends was two inches. The man entered the Leeds Infirmary with the intention of having the limb amputated, it being a useless encumbrance.

Mr. HULKE said that after operation the two ends were brought as close as they could be together, without being in absolute contact. As to the length of time elapsing between the injury and operation, he believed there were others on record, in addition to Mr. Wheelhouse's, which exceeded this. He had two or three times found nerves repaired after division, *e. g.*, after operating for frontal tic. In one case he twice excised a portion of the frontal branch of the fifth nerve, and on each occasion the pain reappeared after a time. In another case, where he cut out nearly half an inch of nerve, sensitiveness recurred. In reply to Mr. Heath, he said that no observations were especially made to ascertain whether the median nerve had any share in the restoration of sensibility; but before the operation the ulnar side of the ring-finger was absolutely numb, and after the operation it regained its sensibility. At least three-quarters of an inch of nerve was removed. He could say nothing as to the condition of the skin on the fingers, and the man had not been to the hospital since he left it to resume his work.

## OPHTHALMOLOGY AND OTOTOLOGY.

### *Tobacco Blindness.*

The following are the conclusions at which Dr. MARTIN has arrived in his recent thesis for the doctor's degree, regarding disorders of the eyes produced by tobacco. 1. It is easy to distinguish between amblyopia caused by alcoholic poisoning and by abuse of nicotine, as in both cases the affection presents characteristic symptoms. 2. The most important of these symptoms is the condition of the pupil, which is dilated in alcoholic amblyopia and contracted in the other case. In the first case, the affection progresses irregularly and with occasional changes for the better, which are followed by relapses; while, in the second case, its progress is slow but uninterrupted. In the one, both eyes are always affected to the same extent; in the other, they are not both affected, or at least not simultaneously. The patients do not see as well at night as during the daytime, and do not suffer from hallucinations, illusions of sight, or diplopia. In alcoholic amblyopia, on the contrary, the patients cannot bear a strong light, see better during the night, and complain of hallucinations, polyopia, and diplopia. 3. Visual disturbances, when connected with poisoning by tobacco, are manifested under the following forms: *a.* binocular amblyopia; *b.* muscular amblyopia with central scotoma; *c.* amblyopia caused by both tobacco and alcohol.—*British Med. Journal*, May 17, 1879.

### *Singing in the Ears treated by Nitrite of Amyl.*

MICHAEL, who was well acquainted with the sedative influence of nitrite of amyl on the sympathetic system, and especially on the vaso-motor nerves, resolved (*Archives Med. Belges*) to try whether it would not prove equally successful in



singing in the ears, and eventually obtained good results in nineteen cases out of twenty-seven.

From two to five drops of nitrite of amyl were inhaled in one dose. The inhalation was continued as long as the following symptoms lasted, viz., a flushed face and injection of the vessels of the eye, and was discontinued the moment the patient began to feel giddy. It was noticed that all the patients who subsequently improved complained that the noise in the ears increased during inhalation, but as soon as the flush began to disappear on the face, the ringing noise decreased, and was less than before the inhalation. In some patients the improvement lasted only one hour, in others for some weeks, but as a rule it lasted from two to ten days. A second inhalation, if not made too soon after the first, had much more marked effects. The author thinks that at least two days must be allowed to elapse between two inhalations; and that the second must not be taken in cases of acute catarrh, or where the singing noise is due to some mechanical cause.—*Lond. Med. Record*, May 15, 1879.

## MIDWIFERY AND GYNÆCOLOGY.

### *The Use of Forceps and its Alternatives in Lingering Labours.*

Dr. ROBERT BARNES, in his opening address at the debate on this subject at the Obstetrical Society of London (*Lancet*, May 17, 1879), stated the following proposition as points that chiefly challenge discussion:—

1. In lingering labour, when the head is in the pelvic cavity, the forceps is better than its alternatives.

2. In lingering labour, when the head is engaged in the pelvic brim, and when it is known that the pelvis is well formed, the forceps is better than its alternatives.

3. In lingering labour, when the head is resting on the pelvic brim, the liquor amnii discharged, and it is known, either by exploring with the hand or by other means, that there is no disproportion, or only a slight degree of disproportion, even although the cervix uteri is not fully dilated, the forceps will generally be better than its alternatives.

4. In proportion as the head is arrested high in the pelvis, in the brim, or above the brim, the necessity, the utility, and safety of the forceps become less frequent.

5. As a corollary from the preceding proposition, increasing caution in determining on the use of the forceps, and greater skill in carrying out the operation, are called for.

In most things there is a middle way. “*Ni jamais, ni toujours*,” is a proverb full of wisdom. I cannot better illustrate the wisdom of deducing the greatest good from over-caution on the one hand and from too bold enterprise on the other, than by citing the precept and practice of Boër. This famous surgeon, having witnessed in Paris the extreme activity of French midwifery, and in London the too procrastinating practice of England, recognized the middle course as the best, constructed his forceps of medium length, saying, “Everything is not to be taken away from Nature, neither is everything to be left to her.”

*Puerperal Fever treated by Benzoate of Soda.*

As this is the first case where benzoate of soda has been given in puerperal fever, the following observations by Dr. PETERSON, published in the *Centbl. für d. Med. Wiss.*, March 8, 1879, will not be found void of interest:—

The patient, a primipara, aged 25, had puerperal fever twelve days after delivery. There was considerable parametritis of the right portion and the fundus of the uterus, the parts were tender to pressure, and the abdomen much distended by gases. The patient had diarrhœa, the pulse was from 140 to 150, and the temperature 40°. After 15 grammes of salicylate of soda had been administered, the temperature sank to 38.8°, but the patient was in an alarming state of prostration; the dyspnœa and flatulence had increased. Wine and strong beer were repeatedly given in large doses, the pulse rose, and a half per cent. solution of quinine administered every two hours, together with 7.5 grammes of salicylate of soda, as the patient complained of singing in the ears. However, as her state did not improve, and the collapse again became threatening, the author resolved to try a solution of benzoate of soda, 10 grammes to 200 grammes of water. The patient rapidly improved, the temperature sank, she slept well, and soon recovered.—*London Med. Record*, May 15, 1879.

*A Giant Birth—One Child weighing twenty-three and three-quarter pounds.*

Dr. A. P. BEACH, of Seville, Ohio, reports (*Med. Record*, March 22, 1879) the case of a child weighing, at birth, 23¾ pounds, which is said to be the largest weight at birth on record. The parents, Captain and Mrs. Bates, are well known to the public, and have been exhibited as giants in the principal towns of this country and Europe. They are respectively, 7 feet 7 inches and 7 feet 9 inches in height. Mrs. Bates had dropsy of the amnion coexistent with general dropsy, from which she suffered during the last months of pregnancy. The water amounted to not less than six gallons. The infant, after considerable difficulty, was safely delivered, and measured 30 inches in height; 24 inches around the breast; 27 inches at the breach; head, 19 inches; and feet, 5½ inches in length. The secundines weighed 10 pounds. The mother was considerably exhausted by the labour, but made a good recovery.

*Special Malady of the Osseous System developed during Intra-uterine Life, and which is generally described under the name "Rickets."*

The main points of M. DEPAUL'S paper (*Révue des Sciences Méd.*, January, 1879) are as follow: 1. The alterations which the bony skeleton can undergo during intra-uterine life have very different origins. 2. Those which are generally described as congenital rickets do not seem to have the same origin as those which characterize rickets developed after birth. 3. The form and direction of the curvatures, the internal structure of the bones, etc., unite in establishing a well-marked line of demarcation. 4. While in the malady developed during foetal life everything is explained by the absence or the irregularity of the deposit of calcareous matter, in true rickets the morbid state attacks bones already formed to a great extent, deranges the regular progress of their development, and submits them to a softening process, which may be deemed the chief cause of the subsequent deformities. 5. Moral emotions on the part of the mother and imagination have no direct influence on these faults of formation of which we are treating. 6. Nor can we assign them to lesions of the nervous centres, and to the muscular retractions which could result therefrom; although a large number of bony deformities seem certainly to have some such origin. 7. The health of

the mother has nothing to do with the development of these symptoms; in no case has there been established the existence of syphilis, rickets, or scrofula. 8. It should be remarked that, in many cases; this malady was manifested in *twin pregnancies*, and this peculiarity has, probably, something to do with its causation. 9. The facts which have been given as examples of congenital fracture have been wrongly interpreted. These are but a variety of one and the same lesion, viz., the absense complete, but limited in extent, of the deposit of the calcareous matter; which, on the other hand, can take place in excess at certain points, and from those enlargements which have wrongly been given as a proof of a process of consolidation. 10. These alterations of the skeleton are far more frequent than is generally believed. 11. Their gravity consists, not only in the changes brought about in the conformation of the limbs, but also in their hindering, by deforming the chest, the mechanism of respiration, and in depriving the brain of sufficient protection against external lesions.—*London Med. Record*, April 15, 1879.

#### *The Diagnostic Puncture of Abdominal Cysts with Serous Contents of Low Density.*

Prof. SPIEGELBERG makes an interesting contribution on this subject to the *Archiv für Gynäkologie* (vol. xiv. s. 175), in which he argues that not only in the case of cysts of the broad ligaments, but even in ovarian cysts, the existence of a fluid of low density and serous nature may be taken as evidence that the cyst wall has ceased to grow actively, and is being merely distended by gradual accumulation of its contents. In such cases, he holds that operation should not be performed, as it is more than likely that after puncture the cyst wall will atrophy, and the ovarian disease disappear.—*Edinburgh Med. Journal*, June, 1879.

#### *Double Oophorectomy.*

Dr. ALEXANDER R. SIMPSON reports (*British Med. Journal*, May 24, 1879) a case of double oophorectomy in which this operation was successfully performed on a woman aged 36, who had suffered from severe dysmenorrhœa during the whole of her menstrual life. He opened the abdomen through the linea alba, and ligatured the pedicle with carbolized silk. Antiseptic precautions were used. The patient made a good recovery, and was greatly benefited, although some irregular menstruation still occurred.

### MEDICAL JURISPRUDENCE AND TOXICOLOGY.

#### *Sulphate of Soda as an Antidote against Poisoning with Carbolic Acid.*

Dr. SONNEBERG has made the important discovery (*Med. Chir. Centr. Bl.* March 21, 1879) that in cases of poisoning with carbolic acid, repeated dressings with a five per cent. solution of sulphate of soda are a very efficient antidote. The urine is at first of a dark green colour, with a slight brown tinge, but soon assumes a normal colour, when the dressings with carbolic acid may be resumed without danger.—*Lond. Med. Record*, May 15, 1879.

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## OBITUARY NOTICE.

"A life well spent, whose early care it was  
His riper years should not upbraid his green ;  
By unperceived degrees he wears away :  
Yet, like the sun, seems larger at his setting."

BLAIR.

SINCE the last number of this Journal was issued, the Senior Editor, who for upwards of half a century was so intimately associated with its best interests, and who during all that long period occupied so conspicuous a place in the professional eye, has passed away, beloved and respected by all who knew him, and venerated by thousands who never saw him, or pressed the hand of the man who had conferred upon them such inestimable benefits. DR. ISAAC HAYS died at his residence, in Philadelphia, on the 12th of April, 1879, aged 83 years. For some time prior to this event, it was apparent that, with the advance of age, his strength was gradually giving way, but it was not until about the middle of last February that any serious inroads were made upon his health, owing to an attack of influenza, which was then epidemic in this city, and which, in his case, as, indeed, in many others, finally terminated in bronchitis. He outlived the attack, but never rallied from its effects, or regained his strength, and died gradually exhausted from the failure of his vital powers. It is gratifying to know that his mental faculties were undimmed by age, and perfect to the last.

Dr. Hays was born in Philadelphia, July 5, 1796, and was the eldest son of Samuel and Richea Gratz Hays. He received his early scholastic training in the then well-known Academy under the charge of the Rev. Samuel B. Wylie, an eminent divine and classical scholar, and entered the University of Pennsylvania in 1812, taking his degree in the department of arts four years afterwards. At the earnest solicitation of his father, who was a merchant largely engaged in the East India trade, he now reluctantly entered upon mercantile life, but finding this to be uncongenial to his tastes, he soon abandoned it, and in 1817 commenced the study of medicine as an office pupil of Dr. Nathaniel Chapman, one of the great medical luminaries of his day. He graduated at the University of Pennsylvania in 1820, the subject of his thesis being "Sympathy." The faculty of this institution consisted at that time of Physick, Wistar, James, Dorsey, Coxe, Chapman, Hare, and Gibson, names famous in American medical history.

The early professional life of Dr. Hays was passed in his native city, in

active study, and in arduous preparation for the great battle of life, those struggles for favour and reputation which few men can so well appreciate as the young physician, especially one beginning his career in a large city, unheralded, and unaided by friends or the patronage of the great and influential. That the young aspirant for position and fame had his share in the world's struggles may well be imagined, but how well he overcame them his whole life abundantly attests. It is only the laggard that falls by the wayside. A youth who is true to himself knows no such word as failure. It may be assumed that Dr. Hays was not indifferent to general practice, but from the beginning of his professional career he devoted much of his leisure to the study of the diseases of the eye, in which, as life advanced, he acquired an extensive reputation as one of the most successful practitioners on this side of the Atlantic. Indeed, he may justly be regarded as one of the pioneers in ophthalmic surgery and medicine in the United States. One of his earliest literary contributions was a long and exhaustive article in the thirteenth volume of the *Philadelphia Journal of the Medical and Physical Sciences* for 1827 on purulent ophthalmia; followed, soon after, by another, still more elaborate, on inflammation of the sclerotics. In 1822, he was appointed one of the Surgeons to the Pennsylvania Infirmary for Diseases of the Eye and Ear; and a similar distinction was conferred upon him on the organization of Wills Hospital, an ophthalmic infirmary, founded in 1834 by Mr. James Wills, a prominent merchant of this city. This position he retained until 1854, when the pressure of increasing demands upon his time compelled him to retire. When Professor Dewees published his work on the *Practice of Medicine* in 1833, Dr. Hays supplied the chapter on diseases of the eye. In 1843, he edited, with numerous additions, and sixty-seven illustrations, Mr., afterwards Sir William, Lawrence's celebrated *Treatise on the Diseases of the Eye*, a work which, under his supervision, passed through three editions, and enjoyed a most extensive circulation in this country. With this edition Mr. Lawrence was so much pleased that he wrote a warm letter of thanks to Dr. Hays. "I feel," he says, "that I could not have received a higher compliment, and I shall always hold the circumstance in grateful remembrance." Dr. Hays devised an instrument, combining the advantages both of a knife and a needle, for the division of hard cataracts, which, although now obsolete, was at one time much employed by American oculists; and he was also the author of a new operation for the cure of strabismus. He was one of the earliest observers to detect astigmatism, and to investigate the subject of colour blindness, which is now attracting so much attention in connection with railway operatives. On the organization, in 1870, of the Ophthalmological Society of Philadelphia, Dr. Hays was elected its first president.

In 1834, Dr. Hays projected the *American Cyclopædia of Practical Medicine and Surgery*, intended as a digest of medical literature. Of this work, which was published by the old firm of Carey, Lea, & Blanchard,

and which was designed to reflect the then existing state of the art and science of medicine in all their diversified branches and ramifications, only two volumes were issued. The contributors to the work were Franklin Bache, Nathaniel Chapman, Reynell Coates, D. Francis Condie, William P. Dewees, Robley Dunglison, Gouverneur Emerson, Eli Geddings, R. E. Griffith, Thomas Harris, Isaac Hays, Hugh L. Hodge, William E. Horner, Samuel Jackson, John K. Mitchell, Robert M. Patterson, John C. Warren, and George B. Wood; all men of more or less professional renown in their day and generation. With such aid and co-operation, it might reasonably have been anticipated that the Cyclopædia would be a success, but such was not to be the case. The real trouble was, not any want of ability on the part of the editor or of his collaborators, but inadequate support. The country was not ripe for a publication projected upon so extended a scale, and involving so much time, labour, and expense. The second volume, issued three years after the first, closed with "axilla." Proceeding at this slow pace, at least fifteen or twenty more closely printed volumes would have been required to complete the work. The learned editor executed his part of the contract with his accustomed zeal and ability. His office mainly consisted in correcting the press, in furnishing bibliographical references, and in writing innumerable articles to fill up the gaps among the more elaborate ones; of which, however, he himself supplied two of the most important and exhaustive for the first volume. Many of the papers of the collaborators constitute elaborate monographs on the subjects of which they respectively treat, and it is safe to affirm that they will forever remain as among the most valuable contributions to the medical literature of the nineteenth century. Among the more able and erudite of these contributions, those of the late Professor Eli Geddings, of Charleston, South Carolina, deserve especial commendation as finished, scholarly, and learned essays. The articles furnished by Drs. Reynell Coates, Hugh L. Hodge, R. E. Griffith, and Robley Dunglison are also worthy of particular encomium. Had the work been completed, it would have formed a lasting monument alike creditable to its original projector and to his learned associates. How such an enterprise would be received at the present day, when the number of medical men is at least four times as great as it was when Dr. Hays assumed the editorship of the American Cyclopædia, and when there is so much more talent among scientific contributors, is a question which can only be determined by a similar effort, which, it may safely be predicted, must ere long be made as one of the prominent necessities of the age. There is sufficient talent, genius, and scholarship among American physicians to accomplish any enterprise to which they may direct their attention.

Dr. Hays never published any original work, but he was the editor of a number of foreign productions, to all of which he made valuable additions. Mention has already been made of his edition of Lawrence's *Treatise on*

*the Eye*. His additions to this work, many of which were the deductions from his own ample experience, were numerous and valuable, and indeed, to use Sir William Lawrence's own words, "might well have constituted a separate publication." In 1829 he brought out an American edition of Arnott's *Elements of Physics*, which went through several editions, and in 1846 one of Hoblyn's *Dictionary of Medical Terms*, works which rendered good service in their day. In 1831 he published jointly with his friend, the late Dr. Robert Eglesfeld Griffith, afterwards Professor of Medicine in the University of Virginia, a translation of Broussais's celebrated treatise on the *Chronic Phlegmasiæ*, in two volumes octavo, and in 1832 his *Principles of Physiological Medicine*. In 1833 he edited the *Cholera Gazette*, a paper designed to communicate useful intelligence respecting the clinical history and treatment of cholera, which had caused such sad havoc during the preceding year in Canada and in our eastern cities. He also contributed, at various times, articles to the pages of the *American Journal of the Medical Sciences*, chief among which are those on the eye, already referred to, on ununited fractures, dislocations of the humerus, and fractures of the ankle-joint. Considering the nature of these topics, one is inevitably led to the conclusion that Dr. Hays's early proclivities were of a decidedly surgical character.

Dr. Hays never occupied any chair in a medical school, but at an early period of his professional life he associated himself with Drs. John D. Godman, R. E. Griffith, and W. H. Keating, as a lecturer on Practical Medicine and Diseases of the Eye and Ear. How long this arrangement continued is not now known. The probability, however, is that it did not last long, as Dr. Godman, the projector of the enterprise, settled in New York, in 1827, as Professor of Anatomy in what was then known as Rutgers Medical College.

The attention of Dr. Hays was not confined exclusively to the study and practice of his profession, or to the onerous duties of a public journalist. The cultivation of natural history had irresistible charms for a mind so æsthetic and so diversified in its tastes and requirements. Many of his earlier leisure hours were spent in pursuits of this kind; and it is a singular fact that he became a member of the Academy of Natural Sciences of Philadelphia two years before he took his medical degree. Throughout his long life he retained his interest in, and affection for, this fascinating study. He was the author of several valuable contributions to palæontology. In 1865 the Academy honoured him with its Presidency, an office which he occupied until December, 1869, when advancing years compelled him to decline a re-election. In 1828 Dr. Hays edited an edition, in three quarto volumes, of Alexander Wilson's *American Ornithology*, that great and wonderful work of the Paisley weaver, peddler, schoolmaster, poet, and naturalist, who, in 1794, emigrated to this country, and who, on his deathbed, expressed a desire, soon fully

carried out, to be buried in the Old Swedes' Church-yard, in Philadelphia,—in a spot where, as he said, “the birds might sing over his grave.” We can well imagine that such a task as this, in the younger and more enthusiastic days of Dr. Hays, must have been essentially a labour of love. The great ornithologist died in 1813, and it is, therefore, not improbable that he and his future editor were personally acquainted with each other. Nay, indeed, it is not at all unlikely that the young student imbibed his first love of natural history from this great and wonderful man, the subject of such a curiously checkered and eventful life:

Although Dr. Hays accomplished a great deal of work in various directions, work always well and conscientiously performed, and evinced a remarkable diversity of talent and learning, his claims to posthumous fame will chiefly rest upon his labours and long career as a public journalist. At the time of his demise he was the oldest editor in the United States, if not in the world. Until last summer this honour, as it may be justly regarded, was enjoyed by the veteran editor of the *New York Evening Post*, Mr. William Cullen Bryant, but at his death it fell to the lot of Dr. Hays. A service, steady and persistent, of any kind of fifty-two years, is no ordinary occurrence; and when it is devoted to constant and assiduous labour in the diffusion of knowledge of the highest interest to mankind, it especially deserves more than passing mention.

The career of Dr. Hays as a medical editor commenced in 1827, in connection with the *Philadelphia Journal of the Medical and Physical Sciences*, founded in 1820 by Dr. Nathaniel Chapman, Professor of Medicine in the University of Pennsylvania; and it is a notable fact, often referred to even at the present day, that this celebrated man chose for the motto of the work the famous paragraph published only a short time previously by Sydney Smith in the sixty-fifth number of the *Edinburgh Review*: “In the four quarters of the globe, who reads an American book? or goes to an American play? or looks at an American picture or statue? What does the world yet owe to American physicians or surgeons?” The editorship of the *Journal* remained exclusively in the hands of its originator until the close of the ninth volume, in 1824, when, in consequence of increasing labours and other engagements, Drs. William P. Dewees and John D. Godman were added to the editorial staff, followed, in February, 1827, by Dr. Isaac Hays—the first step in a career which was destined to last for upwards of half a century. Owing to Dr. Godman's removal to New York in this year, and to the constant demands of an onerous practice upon the time of Dr. Dewees, the editorial labour now devolved upon Dr. Hays. With a view to making the *Journal* more broadly representative and national in character, the co-operation of the leading medical minds in all parts of the country was now secured, and in November, 1827, the title of the journal was changed to the *American Journal of the Medical Sciences*, and, although it was continued until 1841 without any



names upon the title-page save those of the publishers, Dr. Hays had the sole management of the work until 1869, when, in consequence of advancing age he availed himself of the valuable aid of his son, Dr. I. Minis Hays, upon whose shoulders now gracefully rests the mantle so long and so worthily worn by his distinguished father.

Of Dr. Chapman, the founder of the *Philadelphia Journal of the Medical and Physical Sciences*, and, indirectly, of the *American Journal of the Medical Sciences*, and of his two associates upon the editorial staff, Dewees and Godman, this is neither the time nor the place to speak. It is sufficient to state that these are names that are indelibly engraved upon the history of American medical literature. The learned and facetious Chapman, a native of the "Old Dominion," as Virginia was so long called, acquired a world-wide reputation as an able and facile writer, a great wit, and an eloquent, accomplished, and popular teacher in the chair of medicine in the University of Pennsylvania, which he adorned for upwards of a quarter of a century; Dewees, as is well known, became the American autocrat in midwifery; and Godman, more celebrated as an anatomist and naturalist than as a physician, will ever be remembered as a child of genius, born to misfortune, to hard struggles, and to an early grave.

When Dr. Hays assumed the charge of the *American Journal of the Medical Sciences*, he took care to collect around him a group of collaborators representing many of the best and most prominent men in various sections of the country, distinguished for their ability as writers, their learning, and their scientific attainments. The original roll comprised thirty-nine names, to which, on the appearance of the fourth volume, in 1829, four more were added. Of these collaborators—among which are conspicuous the names of Physick, Chapman, Bigelow, Warren, Dudley, Francis, Godman, Hosack, and Dewees—twenty-six occupied chairs in different medical schools, the remainder being prominent medical practitioners. All these men have passed away, the last to do so being the venerable Professor Jacob Bigelow, of Boston, who died only last January at the ripe age of ninety-three years. In the selection of this long list, care was taken to embrace in it all the branches of medicine then taught in our schools, while others were chosen with special reference to their fitness for the important office of reviewers. It will thus be seen that the editorial change in the Journal was inaugurated under the most favourable auspices, the young editor throwing all his energies into the service; while the names of the publishers—Carey, Lea, & Carey—were a sufficient guarantee of the success of the commercial portion of the undertaking. The object of the Journal, as stated in the fourth volume, was to establish a national work, designed to advance the interests of medical science, to foster and develop native talent, to disseminate useful medical knowledge, to elevate the character and dignity of the profession, and to supply a want deeply felt by the American practitioner. Up to that time no American periodical on

so extended a scale, or combining so many important elements, had yet appeared on this continent. Anonymous communications, as well as all personalities, were scrupulously excluded; and another important feature was that the Journal should never condescend to notice any attacks that might be made upon its editors or contributors by disappointed outsiders, smarting under the lash of just criticism or merited rebuke. Each number of the Journal was then, as it is now, issued under three distinct heads—a department for original communications, a review and bibliographical department, and a periscopic department—the latter being devoted to a condensed account of the recent progress of medical science, as taught and practised in different portions of the civilized globe. Sailing under such colours, with the aid of such canvas, the Journal at once inspired public confidence and became an assured success. While other medical quarterlies, both at home and abroad, have succumbed under the pressure of circumstances, brought about by a change in professional sentiment or pecuniary embarrassments, the *American Journal of the Medical Sciences* is proudly holding its own, enshrined in the confidence and affection of the American physician, and supported by a corps of collaborators rich in knowledge and ability, and ambitious of sustaining its best interests as a great national exponent of the medical sciences and of medical literature. When I look at the one hundred and three stately volumes of this Journal, as they stand upon my library shelves, issued under the supervision of one man, I am ready to exclaim, "*Si monumentum requiris, circumspice.*" Such a work is an immense library in itself, and when we reflect that it embodies the results of the practice, observation, and experience of many of the best minds of this and of other countries during a period of upwards of half a century, it is impossible to place too high an estimate upon it. What other journal, American or foreign, can boast of having furnished its readers during the same period upwards of 50,000 octavo pages of closely printed matter, of which at least three-fourths are original? Many of the original articles will be ranked in all time to come as among the most valuable contributions to our medical literature, while not a few of its reviews will be regarded as models of English composition, equal to any that have ever appeared in the United States or Great Britain.

Large as the Journal was, it was found, in the increasing progress of medical art and science, to be insufficient to embrace a satisfactory abstract of the labours of American and European physicians and surgeons; and hence, as early as 1843, the publishers of the Journal, at the instance of the editor, commenced to issue in monthly numbers what is known as the *Medical News*, as a part of that periodical. To meet a still further demand, another journal was issued in 1874, under the same editorial supervision, entitled the *Monthly Abstract of Medical Science*. Both these works have done good service, and have no doubt greatly contributed to the maintenance of the popularity of the parent Journal.

It is a remarkable fact, one, indeed, hardly appreciated even in medical circles of Philadelphia, that at the time Dr. Hays entered upon the active duties of life there was a galaxy of young men in his native city who, born about the same period—that is, either near the close of the last century, or very near the opening of the present—ran together a race of fame and fortune, pitted, as it were, one against another. However this may have been, they all became eminently distinguished either as teachers, authors, or practitioners, or, indeed, in all these relations. These men, mentioned in the order of their seniority, were Samuel Jackson, Franklin Bache, Charles D. Meigs, René La Roche, George McClellan, Hugh L. Hodge, John K. Mitchell, D. Francis Condie, and George B. Wood. To this list may be added the names of John Bell and Reynell Coates. All these were, like Dr. Hays, graduates of the University of Pennsylvania, with a good general education, and several of the most prominent were born in the same year.

The early professional life of Jackson was spent in the apothecary business, and it was not until near middle age that he entered upon the brilliant career which made his name so famous as a teacher and a physician. Connected for a time with what was long known as the Philadelphia Medical Institute, founded by Dr. Chapman, he was for twenty-eight years Professor of the Institutes of Medicine in the University of Pennsylvania, the idol of his classes, and one of the most popular men of his day in and out of the profession. His work, entitled the *Principles of Medicine*, published in 1832, was, scientifically considered, a failure, although it was well received by the profession. Who will ever forget Jackson's handsome, manly face, his melodious voice, his fine conversational powers, or his elegant manners? Franklin Bache will long be remembered as an excellent chemist, and as an acceptable and instructive teacher. As one of the authors of the *United States Dispensatory*, a work which has passed through numerous editions, he rendered most important services to his profession and to his country. What can one say of Charles D. Meigs that has not already been said a thousand times, the popular, beloved, kind-hearted, benevolent, and facetious man, scholar, and professor? Was a teacher ever more worshipped by his pupils? As a writer on obstetrics and gynaecology who does not know Meigs? His treatise on "*Woman and her Diseases*" abounds in delightful reading, but, like all similar productions, is not by any means free from error. René La Roche immortalized himself by his learned and exhaustive treatise on "*Yellow Fever*," a work of gigantic labour, combining the elegance of the accomplished scholar with the patience and the research of the German philosopher. George McClellan, a native of Connecticut, a man of "restless activity and sleepless vigilance," settled in Philadelphia in 1817, where he founded the Jefferson Medical College, and acquired a world-wide reputation as a brilliant and successful surgeon. Hugh L. Hodge, who

died only a few years ago, has, like his illustrious *confrère*, Meigs, left immortal works on midwifery and gynæcology. For many years he adorned the chair of midwifery in the University of Pennsylvania, for which he and Meigs were at one time rival candidates. Of John K. Mitchell's early professional life much was spent in chemical and philosophical pursuits, which very justly soon brought him prominently before the public. When, in 1841, the chair of medicine became vacant in the Jefferson Medical College, he was unanimously elected to fill it, and remained in its occupancy until the time of his death, in 1858. He wrote besides many scientific and medical essays, a volume of poems and a treatise on the cryptogamous origin of malarious and epidemic fevers. Condie was the author of an excellent and popular work on the Diseases of Children, and a most active and useful collaborator of the *American Journal of the Medical Sciences*. He was a rapid writer, and yet his chirography was strikingly beautiful, being a neat round hand as easy to read as print. Of George B. Wood, who died on the 30th of March last, less than a fortnight before Dr. Hays, it is only necessary, in this connection, to observe that he was the worthy peer of this remarkable group of men. Learned, refined, and highly cultured, he was a successful and popular teacher, first of chemistry, then of materia medica, and, lastly, of the principles and practice of medicine, and a copious author; whose works enjoyed a wide circulation at home, passing through numerous editions, while one of them, the *Treatise on Medicine*, was extensively employed for several years as a text-book in the schools of Great Britain. The name of John Bell, who died in 1872, will be long remembered in connection with medical journalism, reprints of foreign works, and an excellent treatise on baths. As a lecturer he failed, and his style as a writer was unfortunately too diffuse. Nevertheless, John Bell performed much useful labour. Of Reynell Coates, a man of brilliant talents and an erratic genius, mention has already been made in connection with Dr. Hays's *Cyclopædia of Practical Medicine and Surgery* to which he was one of the most erudite and elaborate contributors. He had talents of a high order, and had he been spared to his profession he might have earned immortal renown.

Most of the men whose career has been thus briefly sketched died at an advanced age, the life of several of them extending into the eighties. Only three of them died before they reached their seventieth year. All had their early struggles, and several left the world as poor as when they entered it. All were hard-working, ambitious men, with few exceptions devoted students, good writers, and excellent teachers, with scholarly tastes, refined manners, and cultivated intellects. Well may the question be asked, What would Philadelphia have done without them? Who for a third of a century would have supplied their places as journalists, authors, teachers, and practitioners, men who shed so much lustre upon her name and fame? Who could doubt that these men, constantly acting and reacting upon one

another, stimulated each other's ambition, and thus paved the path to glory and to usefulness?

The permanent prosperity of any great and commanding journal, whether medical or literary, must of necessity be materially influenced by the character and stability of its publishers, whatever may be the talent, industry, or genius of its editor. In this particular, Dr. Hays had every reason to congratulate himself; for during his protracted connection with the *American Journal of the Medical Sciences*, and the various changes which the original publishing firm experienced, not a word of misunderstanding ever arose between the existing parties to mar the success of the enterprise, or to disturb their friendly relations. The founder of the house which was destined to attain a world-wide reputation, especially for the part which it has played for upwards of half a century in supplying the country with standard medical works, was Mathew Carey, an eminent philanthropist, whose voluminous writings on the political and social sciences exercised no little influence in their day, and whose *History of the Yellow Fever of 1793* is still referred to by medical writers. In 1783, his political writings having rendered him obnoxious to the British Government, he was obliged to emigrate from Ireland and take refuge in this country, and soon after entered upon the book trade in this city. It was under his auspices that Dr. Chapman brought out the first four volumes of the *Philadelphia Journal of the Medical and Physical Sciences*. In 1822, Mr. Carey retired from the firm, and was succeeded by his son, Mr. Henry C. Carey, and his son-in-law, Mr. Isaac Lea, who have since become so distinguished in the literary and scientific world, the one as a great writer on political economy, and the other as the author of numerous contributions to natural history, evincing great research and rare talent. It is gratifying to know that these two gentlemen are still among us in the enjoyment of excellent health and unimpaired mental vigour. In 1833, the late Mr. William A. Blanchard, a man of remarkable executive ability, was added to the firm, which then became known as Carey, Lea, & Blanchard. In 1839, Mr. Carey retired, followed, in 1851, by Mr. Lea, who was succeeded by his son, Mr. Henry C. Lea, the firm being now Blanchard & Lea. In 1865, Mr. William A. Blanchard retired and his son, Mr. Henry Blanchard, entered, and the firm again took the name of Lea & Blanchard, but only for a few months, Mr. Blanchard being obliged to retire on account of ill health, thus leaving the field solely to Mr. Lea, a gentleman widely known on both sides of the Atlantic, not only as a great publisher, but as an accomplished scholar and vigorous writer.

Dr. Hays took an active interest in everything that related to his profession and to the prosperity of his native city. He was one of the founders of the Franklin Institute, and from 1828 to 1840 acted as its corresponding secretary, an office in which he was succeeded by the late Alexander Dallas Bache, the eminent scientist. He was chairman of the building committee

of the College of Physicians of Philadelphia, and an active member of the American Philosophical Society, of which in early life he was elected a member. He took a prominent part in the organization of the American Medical Association, of which he was the first treasurer and chairman of the committee which framed the admirable Code of Ethics by which the Association, as well as every other medical society in America, has ever since been governed. If this code is not faultless, it is safe to assert that it is as free from errors as it is, perhaps, possible for any code of morals to be. The highest praise has been awarded to it not only in Great Britain but also on the continent of Europe. Dr. Hays was a member of numerous societies—medical, literary, and scientific, both domestic and foreign—and his labours as a public journalist devolved upon him an enormous correspondence with distinguished men on both sides of the Atlantic.

In 1834, Dr. Hays was married to Sarah, daughter of Isaac Minis, Esq., of Savannah, Georgia, who, with four children, survives him. It will not be invading the sanctity of private life to add that he was a most affectionate and devoted husband, and a loving and watchful father. In stature he was about five feet ten inches, well proportioned, with blue eyes, a well-formed head, finely chiselled profile, and a countenance beaming with benevolence. In his manners he was emphatically a gentleman of the old school, bland, gentle, and dignified, with a sweet and subdued voice, and a warm, sympathizing heart. His habits were those of the diligent student. Punctuality was one of his cardinal virtues. He had a daily task before him, and therefore never postponed until to-morrow what he knew was necessary to be done to-day. He was an early riser, and seldom required more than five or six hours of sleep to refresh his mental and physical faculties. His journalistic work was usually done in the early morning, or in the evening, thus leaving him the remainder of the day for his professional, literary, and public duties. As a writer, his style was free, simple, and scholarly, without any effort at ornament or display. Although in early life he was fond of society, yet, as he advanced in years, and his professional labours increased, he was gradually obliged to withdraw himself from the public, and to spend most of his leisure, especially at night, in his library and in the domestic circle, or among a few intimate friends. His last appearance, if my memory serves me, was at a large social gathering at the commencement of the late war, at one of the last meetings of our Wistar Party Club, of which he was an old member. The portrait which accompanies this number is from a daguerreotype taken in 1852.

Dr. Hays had a large and well-selected library, rich in works of the fathers of the profession and in periodical literature, much, if not most, of the latter being sent to him in exchange for the *American Journal of the Medical Sciences*. The exchange list, as it is called, has for many years past been immense, and forms a striking proof of the esteem in which the

editor and his Journal were regarded by the profession in all parts of the civilized world.

If, as Bacon has declared, every man is a debtor to his profession, then I am sure this obligation was never more thoroughly, more conscientiously, or more honestly discharged than in the present instance. No man ever had a more just or a more exalted conception of the functions of a public journalist, of the sanctity of the press, or of the moral duties of an editor, than Dr. Isaac Hays. If he had not possessed all the great qualities of a public editor—brains, great intelligence, judgment, method, patience, boundless industry, and a full appreciation of the wants of his readers—he could not possibly have sustained himself for fifty-two years at the head of such an enterprise. During that long period how many journalists in this and other countries have broken down and brought financial ruin upon themselves and their publishers? Dr. Hays not only possessed the requisite qualifications for carrying on successfully such a work, but he threw his whole soul into the enterprise, and never for a moment lost sight of his great and responsible duties. No man, who has not himself been an editor, can form any adequate idea of the drudgery, toil, and anxiety incident to such a life. The correction of the press is of itself no ordinary task, but when, as in the case of the *American Journal of the Medical Sciences*, such a publication extends its arms into the most remote parts of the civilized world, it is easy to conceive that the man who occupies the editorial tripod must be a person of vast industry, of a clear head, of a far-seeing eye, and of immense executive ability. When the history of American medical literature shall be written, an important place will be assigned to this, the greatest and most gifted medical journalist of the nineteenth century; while the present generation will hold in grateful remembrance the inestimable benefits which he conferred upon his profession and his country.

S. D. Gross.

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## BOYLSTON MEDICAL PRIZE QUESTIONS.

The Boylston Medical Committee, appointed by the President and Fellows of Harvard University, consists of the following Physicians:—

D. H. STORER, M.D.,  
MORRILL WYMAN, M.D.,  
HENRY J. BIGELOW, M.D.,

RICHARD M. HODGES, M.D.,  
CALVIN ELLIS, M.D.,  
SAMUEL CABOT, M.D.

At the annual meeting, held June 9, 1879, it was voted that no dissertation worthy of a prize had been offered on either of the subjects proposed for 1879.

The following are the questions proposed for 1880:—

1. Antiseptic Treatment. What are its Essential Details? How are they best carried out in Practical Form?

2. Diphtheria. Its Causes, Diagnosis, and Treatment.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1880, will be entitled to a premium of One Hundred and Fifty Dollars.

Dissertations on the above subjects must be transmitted, post-paid, to D. H. Storer, M.D., 182 Boylston St., Boston, *on or before the first Wednesday in April, 1880.*

The following are the questions proposed for 1881:—

1. The Effects of Drugs, during Lactation, on either nurse or nursing.

2. Injuries to the Back, without apparent mechanical lesion in their surgical and medico-legal aspects.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1881, will be entitled to a premium of Three Hundred Dollars.

Dissertations on these subjects must be transmitted as above, on or before the first Wednesday in April, 1881.

Each dissertation must be accompanied by a sealed packet on which shall be written some device or sentence, and within which shall be inclosed the author's name and residence. The same device or sentence is to be written on the dissertation to which the packet is attached.

The writer of each dissertation is expected to transmit his communication to the President of the Committee, D. H. Storer, M.D., in a distinct and plain handwriting, *and with the pages bound in book form within the time specified.*

*Any clew by which the authorship of a dissertation is made known to the Committee will debar such dissertation from competition.*

Preference will be given to dissertations which exhibit original work.

All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

1st. That the Board do not consider themselves as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

2d. That in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

RICHARD M. HODGES, M.D., *Sec'y*, Boston, Mass.

Publishers of Newspapers and Medical Journals throughout the country are respectfully requested to notice the above.



## JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA.

*The Fifty-fifth Session of the Jefferson Medical College will begin on Wednesday, October 1st, 1879, and will continue until the 1st of March, 1880. Preliminary Lectures will be held from Monday, 8th of September.*

## PROFESSORS.

JOSEPH PANCOAST, M.D.,  
General, Descriptive, and Surgical Anatomy,  
(Emeritus).

S. D. GROSS, M.D., LL.D., D.C.L. Oxon.,  
Institutes and Practice of Surgery.

ELLERSLIE WALLACE, M.D.,  
Obstetrics and Diseases of Women and Children.

J. M. DA COSTA, M.D.,  
Practice of Medicine.

J. AITKIN MEIGS, M.D.,  
Institutes of Medicine and Medical Jurisprudence.

WM. H. PANCOAST, M.D.,  
General, Descriptive, and Surgical Anatomy.

ROBERT E. ROGERS, M.D.,  
Medical Chemistry and Toxicology.

ROBERTS BARTHOLOW, M.D.,  
Materia Medica and General Therapeutics.

CLINICAL INSTRUCTION is given *daily* at the HOSPITAL OF THE JEFFERSON MEDICAL COLLEGE throughout the year by Members of the Faculty, and by the Hospital Staff, which is constituted as follows:

## Surgeons.

JOHN H. BRINTON, M.D.,  
S. W. GROSS, M.D.,  
R. J. LEVIS, M.D.

## Ophthalmic Surgeon.

WILLIAM THOMPSON, M.D.

## Aural Surgeon.

L. TURNBULL, M.D.

## Physicians.

J. SOLIS-COHEN, M.D.,  
JAMES C. WILSON, M.D.,  
OLIVER P. REX, M.D.,  
W. W. VANVALZAH, M.D.

## Gynæcologists.

F. H. GETCHELL, M.D.,  
J. EWING MEARS, M.D.

## Pathologist.

MORRIS LONGSTRETH, M.D.

A SUMMER COURSE of Lectures is given, beginning in the third week in March, 1880, and extending through the months of April, May, and to the middle of June. There is no additional charge for this Course to matriculates of the College, except a registration fee of five dollars; non-matriculates pay thirty five dollars, which is, however, credited on the amount of fees paid for the ensuing Winter Course.

## FEES.

Matriculation Fee (paid once)	\$5 00
Ticket of each Professor (7) \$20	140 00
Practical Anatomy	10 00
Graduation Fee	30 00

The Annual Announcement, giving full particulars, will be sent on application to

ELLERSLIE WALLACE, Dean.

## PRIZE OF THE ALUMNI ASSOCIATION OF THE COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK.

This prize of \$500, for an original essay on some subject connected with medicine or surgery, is open only to the competition of the Alumni of the College of Physicians and Surgeons.

The conditions upon which the prize will be awarded are as follows:—

1. The subject is left to the option of the competitor.
2. The essay must present sufficient original experimental or clinical observation to make it a useful contribution to medical knowledge.
3. The essay, designated by a motto, must be sent to a member of the Committee on Prize Essays, accompanied by a sealed envelope, inscribed with the motto, and containing the name and address of the author, on or before February 1, 1880.

DR. A. BRAYTON BALL, 38 West 36th St.,  
DR. T. A. McBRIDE, 12 East 28th St.,  
DR. ROBERT F. WEIR, 37 West 33d St.

Committee.

## UNIVERSITY OF PENNSYLVANIA.

## MEDICAL DEPARTMENT.

*Thirty-Sixth Street and Woodland Avenue (Darby Road), Philadelphia.*

One Hundred and Fourteenth Annual Session, 1879-80.

## PROFESSORS.

CHARLES J. STILLÉ, LL.D., Provost.  
 GEORGE B. WOOD, M.D., LL.D., Emeritus Professor of Theory and Practice of Medicine.  
 HENRY H. SMITH, M.D., Emeritus Professor of Surgery.  
 JOHN NEILL, M.D., Emeritus Professor of Clinical Surgery.

JOSEPH LEIDY, M.D., LL.D., Professor of Anatomy.  
 RICHARD A. F. PENROSE, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children.  
 ALFRED STILLÉ, M.D., LL.D., Professor of Theory and Practice of Medicine, and Clinical Medicine.  
 D. HAYES AGNEW, M.D., LL.D., John Rhea Barton Professor of Surgery and Clinical Surgery.

HORATIO C. WOOD, M.D., Professor of Materia Medica, General Therapeutics, and Pharmacy, and Clinical Professor of Nervous Diseases.  
 WILLIAM PEPPER, M.D., Professor of Clinical Medicine.  
 WILLIAM GOODELL, M.D., Professor of Clinical Gynecology.  
 JAMES TYSON, M.D., Professor of General Pathology and Morbid Anatomy.  
 THEODORE G. WORMLEY, M.D., LL.D., Professor of Chemistry.  
 JOHN ASHHURST, Jr., M.D., Professor of Clinical Surgery.  
 HARRISON ALLEN, M.D., Professor of Physiology.  
 WILLIAM F. NORRIS, M.D., Clinical Professor of Diseases of the Eye.  
 GEORGE STRAWBRIDGE, M.D., Clinical Professor of Diseases of the Ear.  
 LOUIS A. DUHRING, M.D., Clinical Professor of Diseases of the Skin.

Matriculates are required to attend three winter courses of instruction of five months each, consisting of graded didactic lectures, clinical lectures, and practical work in laboratories and hospitals.

In the graded curriculum adopted, the elementary branches are taught in the *first* course, and students are finally examined at its conclusion upon General Chemistry, Materia Medica and Pharmacy. In the *second* term, while a sufficient repetition of unfinished branches is secured, certain more practical ones are added, and the examinations on Anatomy, Physiology, and Medical Chemistry, at the end of the term are final. In the *third* course is added practical bedside instruction in Medicine, Surgery, and Gynecology, with clinical facilities in the specialties; and, at its end, students are examined on General Pathology and Morbid Anatomy, Therapeutics, Theory and Practice of Medicine, Surgery, and Obstetrics.

Students who have attended one course in a regular\* medical school will be admitted as students of the second course in the University, after having satisfactorily passed an examination in General Chemistry and Materia Medica and Pharmacy. Students who have attended two courses in a regular medical school will be admitted as students of the third course after examination in General and Medical Chemistry, Materia Medica and Pharmacy, Anatomy, and Physiology.

Graduates of other regular medical schools in good standing will be admitted as students of the third course in this institution without any examination.

Graduates of Colleges of Pharmacy and Dental Colleges in good standing are admitted to the second course in the University without an examination.

In the *Spring session*, beginning the *first Monday in April*, a valuable course on practical and scientific subjects by a large corps of professors and lecturers is given; and the laboratories of Chemistry, Pharmacy, Histology, Physiology, and Pathology are open, affording a valuable post-graduate course.

The *Lectures of the Winter Session of 1879-80 will begin on Wednesday the first day of October, and end on the last day of February.*

The *Preliminary Course will begin on Monday, Sept. 8th.*

FEEs, IN ADVANCE.—1st course of lectures, including matriculation and dissection, \$155. 2d course \$150, including dissection. 3d course \$110, including operating and bandaging. Graduation fee \$30.

For Announcement giving full particulars address

JAMES TYSON, M.D., SECRETARY,  
 P. O. Box 2838, Philadelphia.

## DENTAL DEPARTMENT.

The Trustees have established a Dental Department, which it is designed to make the most complete school of Dentistry in the world. The professors include those of Anatomy, Physiology, Chemistry, and Materia Medica, in the Medical Department, with CHAS. J. ESSIE, M.D., D.D.S., Prof. of Mechanical Dentistry and Metallurgy, and ERWIN T. DARBY, M.D., D.D.S., Prof. of Operative Dentistry. Two years' study, two courses of lectures, and examination at the end of the first and second courses, are the requirements for graduation. Graduates of the Dental Department of the University may become candidates for the degree of Doctor of Medicine after attending one additional course of lectures; but students in Dentistry who desire to take the Medical Degree also, must notify the Secretary of the Department of Medicine of such intention before the beginning of the second course of lectures, and add to the studies of the Dental Department those of the Medical.

FEEs.—Matriculation \$5. For one course of lectures \$100. Dissecting fee \$10. Graduation fee \$30. Sessions commence as those of the Medical Department. For Announcement address CHAS. J. ESSIE, M.D., D.D.S., Secretary, Dental Department, University of Pennsylvania.

\* Homœopathic and Eclectic schools are not recognized as being in this category.

BELLEVUE HOSPITAL MEDICAL COLLEGE,

CITY OF NEW YORK.

MEMBER OF THE AMERICAN MEDICAL COLLEGE ASSOCIATION.

SESSIONS OF 1879-'80.

THE COLLEGIATE YEAR in this Institution embraces a preliminary Autumnal Term, the Regular Winter Session, and a Spring Session.

THE PRELIMINARY AUTUMNAL TERM for 1879-'80 will begin on Wednesday, September 17th, 1879, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures upon special subjects and daily clinical lectures, will be given, as heretofore, by the entire Faculty, in the same number and order as during the Regular Session. Students expecting to attend the Regular Session are recommended to attend the Preliminary Term, but such attendance is not required.

THE REGULAR SESSION will begin on Wednesday, October 1, 1879, and end about the 1st of March, 1880. During this Session, in addition to four didactic lectures on every week-day except Saturday, two or three hours are daily allotted to clinical instruction.

THE SPRING SESSION consists chiefly of recitations from Text-Books. This Session begins on the 1st of March and continues until the 1st of June. During this Session, daily recitations in all the departments are held by a corps of examiners appointed by the Faculty. Short courses of lectures are given on special subjects, and regular clinics are held in the Hospital and in the College building.

FACULTY.

- ISAAC E. TAYLOR, M.D.,  
Emeritus Professor of Obstetrics and Diseases of Women, and President of the Faculty.
- JAMES R. WOOD, M.D., LL.D.,  
Emeritus Professor of Surgery.
- FORDYCE BARKER, M.D., LL.D.,  
Professor of Clinical Midwifery and Diseases of Women.
- AUSTIN FLINT, M.D.,  
Professor of the Principles and Practice of Medicine and Clinical Medicine.
- W. H. VAN BUREN, M.D.,  
Prof. of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.
- LEWIS A. SAYRE, M.D.,  
Professor of Orthopedic Surgery and Clinical Surgery.
- ALEXANDER B. MOTT, M.D.,  
Professor of Clinical and Operative Surgery.
- WILLIAM T. Lusk, M.D.,  
Prof. of Obstetrics and Diseases of Women and Children, and Clinical Midwifery.
- A. A. SMITH, M.D.,  
Lecturer on Materia Medica and Therapeutics, and Clinical Medicine.
- AUSTIN FLINT, Jr., M.D.,  
Professor of Physiology and Anatomical Medicine of the Faculty.
- T. M.D.,  
Prof. of General, Descriptive, and Surgical Anatomy.
- R. OGDEN DOREMUS, M.D., LL.D.,  
Professor of Chemistry and Toxicology.
- EDWARD G. JANEWAY, M.D.,  
Professor of Pathological Anatomy and Histology, Diseases of the Nervous System, and Clinical Medicine.

PROFESSORS OF SPECIAL DEPARTMENTS, ETC.

- HENRY D. NOYES, M.D.,  
Professor of Ophthalmology and Otolary.
- J. LEWIS SMITH, M.D.,  
Clinical Professor of Diseases of Children.
- EDWARD L. KEYES, M.D.,  
Professor of Dermatology, and Adjunct to the Chair of Principles of Surgery.
- JOHN P. GRAY, M.D., LL.D.,  
Professor of Psychological Medicine and Medical Jurisprudence.
- ERSKINE MASON, M.D.,  
Clinical Professor of Surgery.
- LEROY MILTON YALE, M.D.,  
Lecturer Adjunct upon Orthopedic Surgery.
- JOSEPH W. HOWE, M.D.,  
Clinical Professor of Surgery.
- BEVERLY ROBINSON, M.D.,  
Lecturer upon Clinical Medicine.
- FRANK H. BOSWORTH, M.D.,  
Lecturer upon Diseases of the Throat.
- CHARLES A. DOREMUS, M.D., Ph.D.,  
Lecturer upon Practical Chemistry and Toxicology.
- FREDERICK S. DENNIS, M.D., M.R.C.S.,  
WILLIAM H. WELCH, M.D.,  
Demonstrators of Anatomy.

FEES FOR THE REGULAR SESSION:

Fees for Tickets to all the Lectures during the Preliminary and Regular Term, including Clinical Lectures,	
Matriculation Fee .....	\$140 00
Dissection Fee (including material for dissection) .....	5 00
Graduation Fee .....	10 00
	80 00

FEES FOR THE SPRING SESSION:

Matriculation (Ticket valid for the following Winter) .....	\$5 00
Recitations, Clinics, and Lectures .....	35 00
Dissection (Ticket valid for the following Winter) .....	10 00

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT, Jr., Secretary, Bellevue Hospital Medical College.

## HARVARD UNIVERSITY.

MEDICAL DEPARTMENT—BOSTON, MASS.

NINETY-SIXTH ANNUAL ANNOUNCEMENT. (1879-80.)

## FACULTY OF MEDICINE.

CHARLES W. ELIOT, LL.D., President.	CHARLES B. PORTER, M.D., Demonstrator of Anatomy, and Instructor in Surgery.
CALVIN ELLIS, M.D., Prof. of Clinical Medicine, Dean.	FREDERICK I. KNIGHT, M.D., Instructor in Percussion, Auscultation, and Laryngoscopy.
OLIVER W. HOLMES, M.D., Prof. of Anatomy.	J. COLLINS WARREN, M.D., Instructor in Surgery.
HENRY J. BIGELOW, M.D., Professor of Surgery.	REGINALD H. FITZ, M.D., Professor of Pathological Anatomy.
FRANCIS MINOT, M.D., Hersey Professor of the Theory and Practice of Medicine.	WM. L. RICHARDSON, M.D., Instructor in Obstetrics.
JOHN P. REYNOLDS, M.D., Prof. of Obstetrics.	THOMAS DWIGHT, M.D., Instructor in Histology.
HENRY W. WILLIAMS, M.D., Professor of Ophthalmology.	EDWARD S. WOOD, M.D., Prof. of Chemistry.
DAVID W. CHEEVER, M.D., Professor of Clinical Surgery.	HENRY H. A. BEACH, M.D., Assistant Demonstrator of Anatomy.
JAMES C. WHITE, M.D., Prof. of Dermatology.	WILLIAM H. BAKER, M.D., Instructor in Gynecology.
ROBERT T. EDES, M.D., Professor of Materia Medica.	WILLIAM E. HILLS, M.D., Instructor in Chemistry.
HENRY P. BOWDITCH, M.D., Prof. of Physiology.	

## OTHER INSTRUCTORS.

GEORGE H. F. MARKOE, Instructor in Materia Medica.	EDWARD N. WHITTIER, M.D., Assistant in Clinical Medicine.
FRANK W. DRAPER, M.D., Lecturer on Forensic Medicine.	GEORGE M. GARLAND, M.D., Assistant in Physiology.
CHARLES F. FOLSOM, M.D., Lecturer on Hygiene and Mental Diseases.	ELBRIDGE G. CUTLER, M.D., Assistant in Pathological Anatomy.
HENRY P. QUINCY, M.D., Assistant in Histology.	

## THE FOLLOWING GENTLEMEN WILL GIVE SPECIAL CLINICAL INSTRUCTION:

FRANCIS B. GREENOUGH, M.D., and EDWARD WIGGLESWORTH, M.D., in Syphilis.  
 JOHN O. GREEN, M.D., and CLARENCE J. BLAKE, M.D., in Otolaryngology.  
 CHARLES P. PUTNAM, M.D., and JOSEPH P. OLIVER, M.D., in Diseases of Children.  
 SAMUEL G. WEBBER, M.D., and JAMES J. PUTNAM, M.D., in Diseases of the Nervous System.

Persons who hold no degree in arts or science must pass an *examination for admission* to this School, in Latin, in the elements of Physics, and in English. French or German will be accepted instead of Latin. The admission examination will be held June 23, both at Boston and at Cincinnati; on September 22, at Boston only.

Instruction is given by lectures, recitations, clinical teaching, and practical exercises, distributed throughout the academic year. The year begins September 23, 1879, and ends on the last Wednesday in June, 1880. It is divided into two equal terms, either of which is more than equivalent to the former "Winter Session," as regards the amount and character of the instruction. The course of instruction has been greatly enlarged, so as to extend over three years, and has been so arranged as to carry the student progressively and systematically from one subject to another in a just and natural order. In the subjects of anatomy, histology, chemistry, and pathological anatomy, laboratory work is largely substituted for, or added to, the usual methods of instruction.

Instead of the customary oral examination for the degree of Doctor of Medicine, at the end of the three years' period of study, a series of written examinations on all the main subjects of medical instruction is held at the end of each year; and every candidate for the degree must pass a satisfactory examination in every one of the principal departments of medical instruction during his period of study.

## DIVISION OF STUDIES.

*For the First Year*—Anatomy, Physiology, and General Chemistry.

*For the Second Year*—Medical Chemistry, Materia Medica, Pathological Anatomy, Clinical Medicine, Surgery, and Clinical Surgery.

*For the Third Year*—Therapeutics, Obstetrics, Theory and Practice of Medicine, Clinical Medicine, Surgery, and Clinical Surgery.

Students are divided into three classes, according to their time of study and proficiency. Students who began their professional studies elsewhere may be admitted to advanced standing; but all persons who apply for admission to the second or third year's class must pass an examination in the branches already pursued by the class to which they seek admission. The examinations are held in the following order:—

At the end of the first year—Anatomy, Physiology, and General Chemistry.

End of second year—Medical Chemistry, Materia Medica, and Pathological Anatomy.

End of third year—Therapeutics, Obstetrics, Theory and Practice of Medicine, Clinical Medicine, Surgery, and Clinical Surgery.

Examinations are also held before the opening of the School, beginning September 22d.

**REQUIREMENTS FOR A DEGREE.**—Every candidate must be twenty-one years of age; must have studied medicine three full years, have spent at least one continuous year at this school, have passed the required examinations, and have presented a thesis.

**COURSE FOR GRADUATES.**—For the purpose of affording to those already Graduates of Medicine additional facilities for pursuing clinical, laboratory, and other studies, in such subjects as may specially interest them, the Faculty has established a course which comprises the following branches: Histology; Physiology; Medical Chemistry; Pathological Anatomy; Surgery; Auscultation, Percussion, and Laryngoscopy; Ophthalmology; Dermatology; Syphilis; Otolaryngology; Electro-therapeutics; Gynecology; and Obstetrics. On payment of the full fee the privilege of attending any of the other exercises of the Medical School, the use of the laboratories and library, and all other rights accorded by the University will be granted. Single branches may also be pursued. Graduates of other Medical Schools who may desire to obtain the degree of M.D. at this University, will be admitted to examination for this degree after a year's study in the Graduates' Course. Examination on entrance not required.

**FEES.**—For Matriculation, \$5; for the Year, \$200; for one Term alone, \$120; for Graduation, \$30. For Graduates' Course, the fee for one year is \$200; for one Term, \$120; and for single courses such fees as are specified in the Catalogue. Payment in advance.

Members of any one department of Harvard University have a right to attend lectures and recitations in any other department without paying additional fees.

For further information, or Catalogue, address

DR. R. H. FITZ, Sec'y, 108 Boylston St., Boston, Mass.

## CHICAGO MEDICAL COLLEGE.

MEDICAL DEPARTMENT OF THE NORTHWESTERN UNIVERSITY.

SESSION OF 1879-80.

## FACULTY.

N. S. DAVIS, M.D., LL.D., Dean, }	J. H. HOLLISTER, M.D., Cor. Secretary and
H. A. JOHNSON, A.M., M.D., }	Registrar, Professor of General Pathology
Principles and Practice of Medicine and	and Pathological Anatomy.
of Clinical Medicine.	H. P. MERRIMAN, A.M., M.D., Professor of Medi-
EDMUND ANDREWS, A.M., M.D., }	cal Jurisprudence and Hygiene
RALPH N. ISHAM, M.D., }	WM. E. QTIME M.D., Professor of Materia Medica
Principles and Practice of Surgery, and	and General Therapeutics.
of Clinical Surgery.	MARCUS P. HATFIELD, A.M., M.D., Professor of
EDWARD W. JENKS, A.M., M.D., Professor of	Chemistry and Toxicology.
Medical and Surgical Diseases of Women,	LESTER CURTIS, A.M., M.D., Professor of His-
and of Clinical Gynecology.	tology.
E. O. F. ROLER, A.M., M.D., Professor of Ob-	R. L. REA, M.D., Professor of Anatomy.
stetrics and Diseases of Children.	HENRY GRADLE, M.D., Lecturer upon Physiology.
SAMUEL J. JONES, A.M., M.D., Professor of Oph-	ROSWELL PARK, A.M., M.D., Demonstrator of
thalmology and Otolgoy.	Anatomy and Assistant to the Chair of
J. S. JEWELL, A.M., M.D., Professor of Nervous	Anatomy.
and Mental Diseases.	

## GRADED COURSE OF INSTRUCTION.

A graded system of medical instruction was adopted at the organization of this College twenty years ago, and for twelve years it was the only representative of a classified course in this country. The recommendation of this method of teaching by two Medical College Conventions, by the American Medical Association, and by various State Medical Societies; and its more recent adoption by a number of other colleges, including some of the most prominent ones in the land, and its very general approval by the profession at large, afford gratifying evidence that this new departure was a movement in the right direction.

## REQUIREMENTS FOR ADMISSION.

All applicants for admission are required to present evidence of graduation in some literary college, or certificates of attendance upon some scientific school or academy. If the applicant have neither diploma nor certificate, he must sustain a satisfactory examination as to his literary qualifications.

## ADVANCED STANDING.

Students who have read medicine for one full year, may enter upon the *Middle Course*, by sustaining satisfactory examinations upon the studies embraced in the Junior Course.

Students who have read medicine for two years, including attendance upon one full course of lectures in some recognized medical college, may enter the *Senior Course*, by sustaining examinations upon the subjects embraced in the Junior and Middle Courses.

## THE COLLEGE TERM.

A preliminary course of Didactic and Clinical instruction, introductory to the general course, commences September 16th, and continues till the commencement of the regular Session.

The REGULAR COURSE of lectures commences Tuesday, September 30th, and will continue until March 30th, at which time the usual Commencement exercises will be held.

## THE PRACTITIONER'S COURSE.

Designed for practitioners, will commence March 31st, 1880, following the commencement, and will continue till April 23th. This special course is arranged to meet a very general want, and will afford special advantages for a rapid, yet thorough, practical review of the most important subjects in medicine and surgery.

## CLINICAL ADVANTAGES.

Mercy Hospital, with its very perfect appointments; the Dispensary and the College clinics offer an abundance of clinical material in every department of Medical and Surgical teaching. Over fourteen thousand patients were treated here during the last year.

*In the Hospital every Senior student serves as dresser for an allotted term in the surgical wards, and receives a certificate to that effect.*

*Every Senior student has personal charge of one or more cases of obstetrics, under the immediate supervision of the Professor of Obstetrics.*

*In the Gynecological Department, where large numbers of females apply for local treatment, each Senior student is trained by the Professor in the minute details of examination and treatment of the medical and surgical diseases of women.*

## PHYSIOLOGICAL LABORATORY.

Aided by the generous contributions of its alumni, this College is developing a PHYSIOLOGICAL LABORATORY, which will be opened for instruction during the present year.

## PRIZES

Will be given by the Dean, for the best Thesis; by the Professor of Anatomy, a First Prize to the best Anatomist—open to all classes; Second Prize to the best Anatomist in the Junior Class; the Senn Prize, for the best Anatomical Preparation; and the Earl Prize, for the best Essay on Diseases of Children.

## FEES.

Lecture Fees for the College Year, \$75.00. Practitioners' Course, \$30.00. Graduation Fee, \$30.00. Registration Fee, \$5.00. Demonstrators' Ticket, \$5.00. Laboratory Ticket, \$5.00. Hospital Ticket, \$6.00.

For information concerning Text Books, Board, Seats in the College, requirements for Graduations, etc., consult the Annual Announcement, or address

73 Randolph Street, Chicago, Ill.

PROF. J. H. HOLLISTER, M.D.,  
Secretary and Registrar.

# MEDICAL DEPARTMENT OF THE UNIVERSITY OF LOUISIANA—NEW ORLEANS.

## FACULTY.

- T. G. RICHARDSON, M.D., Professor of General and Clinical Surgery.  
 SAMUEL M. BEMISS, M.D., Professor of the Theory and Practice of Medicine and Clinical Medicine.  
 STANFORD E. CHAILLÉ, M.D., Professor of Physiology and Pathological Anatomy.  
 JOSEPH JONES, M.D., Professor of Chemistry and Clinical Medicine.  
 SAMUEL LOGAN, M.D., Professor of Anatomy and Clinical Surgery.  
 ERNEST S. LEWIS, M.D., Professor of General and Clinical Obstetrics and Diseases of Women and Children.  
 JOHN B. ELLIOTT, M.D., Professor of Materia Medica and Therapeutics and Clinical Medicine.  
 ALBERT B. MILES, Demonstrator of Anatomy.

The next annual course of instruction in this Department (now in the forty-sixth year of its existence) will commence on Monday, the 20th day of October, 1879, and terminate on Saturday, the 14th day of March, 1880. The first three weeks of the term will be devoted exclusively to Clinical Medicine and Surgery at the Charity Hospital; Practical Chemistry in the Laboratory; and dissections in the spacious and airy Anatomical Rooms of the University.

The means of teaching now at the command of the Faculty are unsurpassed in the United States. Special attention is called to the opportunities presented for

## CLINICAL INSTRUCTION.

The Act establishing the University of Louisiana gives the Professors of the Medical Department the use of the great Charity Hospital as a school of practical instruction.

The Charity Hospital contains nearly 700 beds, and received, during the last year, more than six thousand patients. Its advantages for professional study are unsurpassed by any similar institution in this country. The Medical, Surgical, and Obstetrical Wards are visited by the respective professors in charge daily, from eight to ten o'clock A. M., at which time all the students are expected to attend and familiarize themselves, *at the bedside of the patients*, with the diagnosis and treatment of all forms of injury and disease.

The regular lectures at the hospital, on Clinical Medicine by Professors Bemiss, Elliott, and Joseph Jones, Surgery by Professors Richardson and Logan, Diseases of Women and Children by Professor Lewis, and Special Pathological Anatomy by Professor Chaillé, will be delivered in the amphitheatre on Monday, Wednesday, Thursday, and Saturday, from 10 to 12 o'clock A. M.

The administrators of the hospital elect annually, by competitive examinations, *twelve resident students*, who are maintained by the institution.

## TERMS.

For the Tickets of all the Professors . . . . .	\$140 00
For the Ticket of Practical Anatomy . . . . .	10 00
Matriculation Fee . . . . .	5 00
Graduation Fee . . . . .	30 00

Candidates for graduation are required to be twenty-one years of age; to have studied three years; to have attended two courses of lectures, and to pass a satisfactory examination.

Graduates of other respectable schools are admitted upon payment of the Matriculation and half lecture fees. They cannot, however, obtain the Diploma of the University without passing the regular examinations and paying the usual Graduation Fee.

As the practical advantages here afforded for a thorough acquaintance with all the branches of medicine and surgery are *quite equal* to those possessed by the schools of New York and Philadelphia, the same fees are charged.

For further information, address

T. G. RICHARDSON, M.D., *Dean*.

# UNIVERSITY OF THE CITY OF NEW YORK. MEDICAL DEPARTMENT.

410 East Twenty-Sixth St., opposite Bellevue Hospital, New York.

THIRTY-NINTH SESSION—1879-80.

## FACULTY OF MEDICINE.

REV. HOWARD CROSBY, M.D., LL.D., Chancellor of the University.

ALFRED C. POST, M.D., LL.D., Emeritus Professor of Clinical Surgery; President of the Faculty.

CHARLES INSLEE PARDEE, M.D., Professor of Diseases of the Ear; Dean of the Faculty.

JOHN T. DARBY, M.D., Emeritus Professor of Surgery.

JOHN C. DRAPER, M.D., LL.D., Professor of Chemistry.

ALFRED L. LOOMIS, M.D., Professor of Pathology and Practice of Medicine.

WILLIAM DARLING, A.M., M.D., F.R.C.S., Professor of Anatomy.

WILLIAM H. THOMSON, M.D., Professor of Materia Medica and Therapeutics.

J. W. S. ARNOLD, M.D., Professor of Physiology and Histology.

J. WILLISTON WRIGHT, M.D., Professor of Surgery.

WM. M. POLK, M.D., Professor of Obstetrics and Diseases of Women and Children.

FANEUIL D. WEISSE, M.D., Professor of Practical and Surgical Anatomy.

LEWIS A. STIMSON, M.D., Professor of Pathological Anatomy.

A. L. RANNEY, M.D., Adjunct Professor of Anatomy.

JOSEPH E. WINTERS, M.D., Demonstrator of Anatomy.

## POST-GRADUATE FACULTY.

D. B. ST. JOHN ROOSA, M.D., Professor of Ophthalmology.

WM. A. HAMMOND, M.D., Professor of Diseases of the Mind and Nervous System.

STEPHEN SMITH, M.D., Professor of Orthopædic Surgery.

J. W. S. GOULEY, M.D., Professor of Diseases of the Genito-Urinary System.

MONTROSE A. Pallen, M.D., Professor of Gynæcology.

HENRY G. PIFFARD, M.D., Professor of Dermatology.

A. E. MACDONALD, M.D., Professor of Medical Jurisprudence.

THE COLLEGIATE YEAR is divided into three Sessions: a Preliminary Session, a Regular Winter Session, and a Spring Session.

THE PRELIMINARY SESSION will commence September 17, 1879, and will continue until the opening of the Regular Winter Session. It will be conducted on the plan of that Session.

THE REGULAR WINTER SESSION will commence on the 1st of October, 1879, and end about the 1st of March, 1880.

The location of the new College edifice being immediately opposite the gate of Bellevue Hospital, and a few steps from the ferry to Charity Hospital, Blackwell's Island, the Students of the University Medical College are enabled to enjoy the advantages afforded by these Hospitals, with the least possible loss of time. The Professors of the practical Chairs are connected with the Hospitals, and the University Students are admitted to *all the Clinics* given therein *free of charge*.

In addition to the daily Hospital Clinics, there are eight Clinics each week in the College Building. Five Didactic Lectures will be given daily in the College building, and Evening Recitations will be conducted by the Professors of Chemistry, Practice, Anatomy, Materia Medica, etc., Physiology, Surgery, and Obstetrics, upon the subjects of their Lectures.

THE SPRING SESSION embraces a period of twelve weeks, beginning in the first week of March and ending the last week of May. The daily Clinics, Recitations, and Special Practical Courses will be the same as in the Winter Session, and there will be Lectures on Special Subjects by the Members of the Post-Graduate Faculty.

THE DISSECTING ROOM is open throughout the entire Collegiate year; material is abundant, and it is furnished free of charge.

STUDENTS WHO HAVE STUDIED TWO YEARS, and who have attended two full courses of lectures, may be admitted to examination in Chemistry, Anatomy, and Physiology, and, if successful, will be examined at the expiration of their full course of study on Practice, Materia Medica and Therapeutics, Surgery, and Obstetrics; but those who prefer it may have all their examinations at the close of their full term.

## FEES.

For Course of Lectures	\$140 00
Matriculation	5 00
Demonstrator's fee, including material for dissection	10 00
Graduation fee	30 00
Post-Graduate certificate	30 00

For further particulars and circulars address the Dean,

Prof. CHAS. INSLEE PARDEE, M.D.,  
University Medical College, 410 East 26th St., New York.

THE  
AMERICAN JOURNAL  
OF THE MEDICAL SCIENCES  
FOR OCTOBER 1879.



# CONTRIBUTORS TO THIS VOLUME.

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 WILLIAM C. DABNEY, M.D., of Charlottesville, Virginia.  
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 F. C. HOTZ, M.D., Ophthalmic Surgeon to the Illinois Charitable Eye and Ear Infirmary, Chicago.  
 JAMES H. HUTCHINSON, M.D., Physician to the Pennsylvania Hospital, Phila.  
 JAMES NEVINS HYDE, M.D., Lecturer on Dermatology and Syphilis in Rush Med. College, Chicago.  
 WILLIAM W. KEEN, M.D., Surgeon to St. Mary's Hospital, Philadelphia.  
 JNO. T. KING, M.D., of Baltimore, Maryland.  
 M. CAREY LEA, Esq., of Philadelphia.  
 JOHN A. LIDELL, M.D., Late Surgeon to Bellevue Hospital, New York.  
 CHARLES K. MILLS, M.D., of Philadelphia.  
 ISAAC OTT, M.D., of Easton, Penna.  
 JOHN H. PACKARD, M.D., Surgeon to the Episcopal Hospital, Philadelphia.  
 THEOPHILUS PARVIN, M.D., of Indianapolis, Ind.  
 D. WEBSTER PRENTISS, M.D., Prof. of Mat. and Therap. in National Med. College, Washington, D. C.  
 B. LINCOLN RAY, M.D., of Philadelphia.  
 J. C. REEVE, M.D., of Dayton, Ohio.  
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 JOHN B. ROBERTS, M.D., of Philadelphia.  
 BEVERLEY ROBINSON, M.D., Lecturer on Clinical Medicine at Bellevue Hospital Medical College, New York.  
 W. S. W. RUSCHENBERGER, M.D., Surgeon U. S. Navy.  
 SAMUEL SEXTON, M.D., Aural Surgeon to the New York Eye and Ear Infirmary.  
 WHARTON SINKLER, M.D., Physician to the Episcopal Hospital, Philadelphia.  
 J. LEWIS SMITH, M.D., Clin. Prof. of Diseases of Children in Bellevue Hosp. Med. College, New York.  
 ROBERT MEADE SMITH, M.D., Demonstrator of Physiology in University of Pennsylvania.  
 LEWIS A. STIMSON, M.D., Surgeon to the Presbyterian Hospital, New York.  
 L. McLANE TIFFANY, M.D., Prof. of Operative Surgery in the University of Maryland.  
 JAMES TYSON, M.D., Prof. of Gen. Pathol. and Morbid Anatomy in the University of Penna.  
 W. H. VAN BUREN, M.D., Professor of Surgery in Bellevue Hospital Medical College, New York.  
 ARTHUR VAN HARLINGEN, M.D., of Philadelphia.  
 JAMES C. WHITE, M.D., Professor of Dermatology in Harvard University.  
 JAMES C. WILSON, M.D., Physician to the Philadelphia Hospital.  
 FRANK WOODBURY, M.D., Physician to the German Hospital, Philadelphia.

## TO READERS AND CORRESPONDENTS.

ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of November.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent to the Editor.*

The following works have been received:—

Étude Historique et Clinique sur la Trépanation du Crâne la Trépanation guidée par les Localisations Cérébrales. Par le Dr. JUST LUCAS-CHAMPIONNIÈRE. Paris : V. A. Delahaye et Cie, 1878.

Ueber die Operation der Nasenpolypen. Von Dr. ARTHUR HARTMANN in Berlin.

Guy's Hospital Reports. Edited by H. G. HOWSE, M.D., and FREDERICK TAYLOR, M.D. Third series. Vol. XXIV. London : J. & A. Churchill, 1879.

A Manual and Atlas of Medical Ophthalmoscopy. By W. R. GOWERS, M.D., F.R.C.P., Assist. Prof. of Clinical Medicine in University College, etc. London : J. & A. Churchill, 1879.

Injuries and Diseases of the Lymphatic System. By S. MESSENGER BRADLEY, F.R.S.C. London : J. & A. Churchill, 1879.

The Causes and Results of Pulmonary Hemorrhage; with Remarks on Treatment. By REGINALD E. THOMPSON, M.D. Cantab., Sen. Assist. Phys. and Pathologist to Hospital for Consumption, Brompton. London : Smith, Elder & Co., 1879.

Eye-ball-Tension. its Effects on the Sight, and its Treatment. By W. SPENCER WATSON. London : H. K. Lewis, 1879.

Remarks on the Routine Use of the Ophthalmoscope in Cerebral Disease. By J. HUGHLINGS JACKSON, M.D. London : J. & A. Churchill, 1879.

Pharmacopœia of Royal London Ophthalmic Hospital. Sixth ed. London, 1879.

Villous Disease of the Bladder, and its Surgical Treatment. By ROBERT S. HUDSON, M.D. Dublin, 1879.

Two Cases of Paroxysmal Hæmatinuria; with Note on the Spectroscopic Examination. By R. W. FORREST, M.D., and JAMES FINLAYSON, M.D.

On Supernumerary Nipples and Mammæ. By J. MITCHELL BRUCE, M.D.

A Manual of Midwifery, for Midwives and Medical Students. By FANCOURT BARNES, M.D. Aber., M.R.C.P. Lond. Philadelphia : Henry C. Lea, 1879.

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ARTICLE I.

ON PHANTOM STRICTURE AND OTHER OBSCURE FORMS OF RECTAL DISEASE. By W. H. VAN BUREN, M.D., Professor of Surgery in Bellevue Hospital Medical College, New York.

THE causes of stricture of the rectum are recognized by practical surgeons as often obscure, and the difficulties which surround its diagnosis are in many cases apparently insurmountable. Hence the unsatisfactory results which so often attend the treatment of this disease. But if in the rarity of well-observed cases of a disease which is by no means of common occurrence, and in the conflict of opinion as to the part played by the several venereal diseases in its causation, our etiological knowledge is still vague and advances but slowly, surely the great advantages derived of late years from the use of anæsthetics and other aids to exploration should be by this time bearing some fruit, at least in diagnosis, and in dispelling old errors which complicate the subject and add largely to its difficulties.

The following cases and remarks are offered in the hope of throwing some light upon these obscure questions, and, even if they fail in this object, of attracting attention to a class of cases in which greater certainty of knowledge promises to save much human suffering, both of mind and body.

By the term phantom stricture is meant the presence of rational signs, and often of fallacious physical signs, of organic stricture, causing belief in the existence of the disease in a case in which it is in reality non-existent.

In discussing the subject of stricture of the rectum, the question as to the importance of *muscular spasm*—whether it is capable alone of constituting stricture, or of causing or of complicating true organic stricture—

presents itself at the outset as a source of uncertainty. The term spasmodic stricture has a certain vagueness, as employed in surgical technology, which I desire to get rid of, and to this end I shall assume, in accordance with most recent authorities, that neither in imaginary nor in actual stricture of the rectum is muscular spasm an element of any real practical importance. As regards the œsophagus, the urethra, and other canals with muscular walls, this assertion might be perhaps difficult to justify; and the older writers have taken advantage of the analogy to assume, without adequate proof, the existence of spasmodic stricture of the rectum. But, by the aid of anæsthetics, this has been demonstrated to have a very doubtful existence, except perhaps as an epi-phenomenon or additional feature of organic stricture. No modern authorities admit the existence of pure spasmodic stricture of the rectum, except in its lowermost portion, where it is surrounded by the external sphincter. Muscular spasm may, therefore, be considered as excluded in studying the causes of phantom or imaginary stricture of the rectum.

This singular affection will be found in most cases to take its origin in the constipation and difficulty of defecation so common in dyspeptic and hypochondriacal subjects; and the idea thus begotten of the existence of a physical obstacle in the lower bowel is too often confirmed by some professional opinion, based neither on careful physical exploration nor on full practical knowledge. The obstruction almost certain to be encountered when a bougie is inserted into the rectum, from contact with a fold of the gut or with the promontory of the sacrum, is accepted as evidence of stricture; the novelty and simplicity and apparent effectiveness of the manœuvre please the patient; the impression produced upon the lower bowel provokes a fuller stool; and, when the bougie possibly enters more freely than usual, it is assumed that "the spasm is giving way." As an imaginary stricture is always located beyond the reach of the finger, a prompt demonstration of its non-existence is not easily arrived at; and the arrest of the bougie by the promontory of the sacrum has a singularly convincing effect upon the mind of the patient and of the physician. The invalid who once fairly enters on this vicious circle is therefore likely to travel in it indefinitely, for imaginary diseases are notoriously slow in getting well. The case recorded by Syme is worthy of repetition in this connection; it is authentic, bears directly on the point which I desire to make, and will always possess interest as a beacon against error. Like the legal cases admitted as precedents, it should be held in memory.

CASE I.—He introduces the case<sup>1</sup> as "an elderly lady whom I saw with Dr. Begbie." She had been supposed to suffer from stricture of the rectum between five and six inches up the gut, and had been subjected to treatment for it, during several years, before coming under Dr. Begbie's care, "by two gentlemen of the highest respectability in this city. Finding that the coats of the rectum, though greatly dilated, were quite smooth and apparently sound in their texture, so far

<sup>1</sup> Syme on Diseases of the Rectum, Edinburgh, 1838.

as my finger could reach, and conceiving that the symptoms of the case denoted a want of tone or proper action rather than mechanical obstruction of the bowels, I expressed a decided opinion that there was no stricture in existence. Not many months afterward the patient died, and, when the body was opened, not the slightest trace of contraction could be discovered in the rectum or any other part of the intestinal canal. One of the gentlemen who had been formerly in attendance was present at this examination, and, wishing to know what had occasioned the deception, which he said had led to more than *three hundred hours* being spent by himself and his colleague in endeavours to dilate the supposed stricture with bougies, he introduced one, as he had been wont to do, and found that upon arriving at the depth it used to reach its point rested on the promontory of the sacrum."

The following case, which occurred many years later in another hemisphere, is an example, apparently, of similar self-deception.

CASE II.—Mr. J. E., a dyspeptic middle-aged banker, from a western State, consulted me in 1854 in consequence of the drudgery to which he was subjected in being compelled to introduce a bougie into his rectum every other day for half an hour "for a stricture;" and without this manœuvre he said he was unable to get a passage from his bowels. He had been pursuing this practice for nearly three years in consequence of advice received from more than one highly respectable professional source, and he was anxious for more effective and radical treatment. There was no stricture within reach of the finger, nor could I discover any evidences, rational or physical, of obstruction higher up, and, finding that his favourite bougie (for he had quite a collection of them) penetrated no further than my finger had reached, I suspected that the instrument was simply acting as a suppository in provoking action of the bowels, and that the real difficulty in defecation consisted in want of natural action arising from other causes. I encouraged the patient therefore to adopt a more rational and varied diet and a less sedentary life, and induced him, not without some difficulty, to discontinue the bougie. Mr. E. gradually became reassured, and adopted my opinion and suggestions. He subsequently took up his permanent residence in this city, and has since been uninterruptedly under my observation, but has never had any return of symptoms suggestive of stricture of the rectum.

But the promontory of the sacrum is not the only source of possible deception when the rectum is explored by a bougie beyond the reach of the finger. The walls of the rectal pouch tend to fall into loose folds when empty, and they present also certain slight permanent partial constrictions or narrowings. The uppermost one of these corresponds with the level at which the rectum gets its complete peritoneal investment. A normal narrowing at this point had been already frequently recognized, and the fact has been confirmed, by good observers, in the experiments in manual exploration recently practised upon the rectum.<sup>1</sup>

Other writers have described slighter and more or less constant permanent narrowings at and below this point of the rectum as a "third sphincter," and, in fact, have cumbered the archives of surgery with a good deal of fruitless speculation concerning an organ to which anatomy and physi-

<sup>1</sup> See article by Mr. Walsham in the last edition of Holden's Landmarks, p. 70, London, 1876.

ology have been equally unsuccessful in assigning either certainty of location or certainty of function. Dr. Chadwick, of Boston,<sup>1</sup> has shown by his own and other recent researches, that all the so-called "internal sphincters" of the rectum, including the upper band of circular fibres spoken of as a "third sphincter," and differently described by Velpeau, Nélaton, and Hyrtl, are simply bundles of ordinary muscular fibres of the intestine, differing from each other only in volume and power, and that their function is *not to obstruct the gut and arrest its contents*, but, like all other circular intestinal fibres, *to urge by their peristaltic contractions the contents of the bowels onwards*. He demonstrates that the true and only power of arrest resides in the external voluntary *sphincter ani*, aided by the perineal muscles; that the bundles of *involuntary* fibres, if entitled to any special designation, should be called "detrusors" and not "sphincters;" that they form a part of the apparatus by which peristalsis is effected, and that for this purpose they are under central control, being stimulated by the vagus, and inhibited by the splanchnics, dilating and contracting with a certain rhythmical precision under the reflected stimulus of fecal distension.

For our present purpose Dr. Chadwick's researches concerning the "so-called internal sphincter" suggest two practical deductions: first, that the uppermost of these heavier bundles of involuntary fibres, especially when it forms a sort of upper limit to the rectal pouch posteriorly, often corresponds with a projecting fold of the rectum, and is liable to offer an obstacle to the passage of the bougie, and thus to simulate a stricture;<sup>2</sup> second, that the nerve force which presides over the rhythmical contractility of the unstriped muscle of the intestinal walls is liable, under morbid influences, to diminish or to fail, and that atony of the *detrusor* muscular apparatus is a not uncommon cause of the difficulty in defecation which is ascribed to stricture. I would remark also, by way of enforcing the importance of the latter deduction, that the evolution of gases and their absorption by the intestinal surface are phenomena admitted to be due to disturbed—generally defective—nerve power; so, also, is the diminished follicular secretion of lubricating mucus, causing unnatural dryness of these surfaces; and that these conditions, which often accompany, if they do not actually cause, failure in function on the part of the large bowel, are remediable in most cases by rational therapeutics.

CASE III.—Gen'l D., æt. 47, a fine-looking man, of good constitution, married, habitually overworked in railroad management in the West, came to the city in March, 1877, in search of relief from a difficulty in defecation, from which he had suffered for ten years; speaking of his malady as a "stricture of the rectum," which, he had been told, existed at five inches from the anus. In a note of his case taken by my associate, Dr. Keyes,

<sup>1</sup> Gynæcological Transactions, vol. ii. 1877.

<sup>2</sup> Dr. C. himself testifies: "This obstacle I have repeatedly met during the past two years, and erroneously supposed to be the projecting promontory of the sacrum."

the rectal trouble is referred to as "chronic diarrhoea and dysentery with ulceration of the lower bowel during service in the army from 1861 to 1865, the symptoms gradually assuming an obstructive character." The stools were scanty and difficult, "pipe-stem" in size, never secured without a previous enema; "chunks of feces" and "wads of pus" are spoken of as sometimes expelled. The diagnosis of stricture made, according to the patient, in Chicago, Ill., in 1868, was afterwards confirmed by Dr. Van Buren in N. Y., who advised a trip abroad; by Nélaton and Dolbeau who were consulted in Paris, and afterwards by Hamilton, of Dublin. All advised continuance in the use of bougies, declining to operate so high up. In despair of recovery he now revisits New York, determined to have an operation performed for his relief.

The patient was accordingly etherized for thorough exploration, and, after stretching the sphincter, a rectal caoutchouc bougie of the largest size was passed ten inches into the bowel without difficulty. On withdrawing the bougie after largely inflating its terminal bulb, the latter was slightly obstructed by what seemed to be a muscular band at about five inches. As far as could be ascertained by inspection, this band was not cicatricial, there was no evidence of the previous existence of any ulcer at the spot, and the mucous membrane above it was healthy. To remove all doubt I felt justified in requesting Dr. Keyes to introduce his hand, which measured nine inches around, into the rectum. It passed readily through the supposed stricture, and into the sigmoid flexure. The muscular band was recognized, but yielded with the slightest resistance. It was situated at the upper limit of the rectal pouch, about on a line with the reflexion of the peritoneum. The patient was somewhat sore for a day or two, but suffered no serious harm from the exploration.

I was struck by one of Gen'l D.'s reminiscences, which occurred to him in the effort, apparently, to reconcile himself to the conclusion which I was enforcing that he certainly had no stricture. "Well," said he, "I remember thinking how strange it was that when I was camping out during the grouse-shooting season I could always go out in the bush and get a good satisfactory stool every morning."

As he had derived positive benefit for the time from his former trip abroad, I advised him to cross the ocean again, to use a laxative pill containing the choleate of soda, and, when he returned to business, to interpolate as much grouse-shooting as possible.

I am indebted to Dr. Keyes for the record of the following case:—

CASE IV.—Rev. I. B., 41, unmarried, applied for relief in June, 1877, for stricture of the rectum high up. Thinks he has two strictures. Has been suffering from dyspepsia and constipation for fifteen years. Has used much medicine, and, by the advice of an irregular practitioner of much popular reputation in rectal diseases, has been introducing a large bougie six inches or more up the rectum four times a week, at intervals, for several years. Says, moreover, that his "stools are uniformly flattened," and that he voids an excess of rectal mucus.

No evidences of stricture could be found on the most thorough exploration.

This patient had suddenly taken to hard study in order to become a clergyman, after years of active and laborious life in another capacity in the open air; he has a marked gouty constitution, and inherits dyspepsia. He was disabused as to the existence of any strictures, advised more outdoor life and a laxative pill, as in the last case. Some time afterwards a



grateful letter was received from Mr. B. announcing a decided change for the better.

The terms "pipe-stem," "flattened," and "tape-like," as applied to the appearance of stools, and also the expression "wads of pus," suggest two common sources of error in diagnosis; for these appearances do not necessarily mean stricture, nor even ulceration looking to subsequent stricture; and as in the cases just detailed they may be entirely delusive. In true stricture the feces, when solid, are in small lumps, resembling sheep-dung. An elongated mass must necessarily take its shape and size from the orifice of the anus, through which it is last extruded. The only exception to this is when the sufferer, by extreme straining, has forced his stricture far enough through the anal opening to get its own final imprint upon the extruded material; and this I have known to occur. Then, again, it is a very common occurrence for a victim of fancied rectal disease to report the daily evacuation of pus, which, on inspection, is found to be simply the normal jelly-like rectal mucus, which is always stained more or less deeply yellow by the bile in the feces. This mucus, especially where efforts at stool are frequent, is always more liberally secreted, and its quantity always greater, than is generally supposed. Moreover, this pus-like material is often streaked with blood, or accompanied by positive hemorrhages from hemorrhoidal congestion aggravated by straining. These appearances are very likely to suggest the presence of serious disease to any anxious patient who watches himself too closely.

Quain, who says he has "known repeated instances in which the bougie had been passed at short intervals for supposed or imputed stricture, where none had ever existed,"<sup>1</sup> quotes the following case:—

"A medical practitioner under Dr. Burne's care for broken health from excess and irregular habits, was persuaded by a surgeon that his ailments were due to stricture of the rectum, although his bowels acted regularly every day, and, contrary to the advice of his physician, he submitted to treatment with a bougie, but, after some months' trial, became convinced of its uselessness, and gave it up. On dissection of the body, which was made not long after, 'no stricture nor trace of stricture could be discovered, either in the rectum, colon, or intestinal canal.'"<sup>2</sup>

Finally, medical men, even where their own sensations are in question, are liable to deceive themselves. Obviously there is no lack of evidence that honest men may fall into error as to the existence of stricture of the rectum. Many cases like those first recorded have doubtless never seen the light. Moreover, patients often manifest a singular facility, with which practical men are familiar, for being persuaded of the actual existence of disease which is entirely imaginary; and, unhappily, there are amongst those to whom patients appeal, men who do not scruple to take advantage of their credulity. But there are also, I am convinced, many

<sup>1</sup> Diseases of the Rectum, by Richard Quain, F.R.S., N. Y., 1840, p. 219.

<sup>2</sup> A Treatise on the Causes and Consequences of Habitual Constipation, Reprint, N. Y., 1840, p. 149.

well-read practitioners who have been led into error by the common but vaguely expressed belief in "spasmodic stricture" of the rectum, implied rather than openly defended, by many good English authors. As I have, perhaps, passed over this point in too summary a manner, I will discuss more fully the considerations which have led me to believe in the non-existence of obstruction in the rectum from this cause; for the idea of spasm as a cause of stricture of the rectum has secured such a degree of favour in the professional as well as in the popular mind—as in the case of the urethra—that the simple assertion that it is not admitted by modern authorities, may not be accepted as final.

The fanciful theory that spasm of the voluntary muscle surrounding the membranous urethra comes by reflex action from organic stricture formed nearer to its meatus, which has been made the basis of so much doubtful practice in this country, is, happily, for anatomical reasons, not applicable to the rectum.<sup>1</sup> But in the earlier half of this century a similar delusion as to the great frequency of rectal stricture, its origin in spasm, and its curability by the bougie, was so prevalent in England that the fear of this disease grew to be a national peculiarity. It was, in fact, an example of the "epidemic terror" which Goldsmith had described in the *Citizen of the World* as one of the peculiarities of his countrymen, and which was prevailing at the time he wrote in the form of a dread of mad dogs.<sup>2</sup>

A recent French<sup>3</sup> author repeats an illustrative story of a lady in London who, recommended to a specialist for costiveness, was examined with a bougie and pronounced strictured. Her husband, surprised and angry at the liberty taken with his wife, rushed off with a horse-whip to the house of the offender, but came home again after a little to his anxious partner confessing that he had grievously wronged a most worthy gentleman. The specialist had not only satisfied him as to the certainty of the lady's malady, but had proved, by inserting a bougie, that he also had a

<sup>1</sup> It is more than probable that Verneuil had thought out the possibility of strengthening this theory, which he was disposed to defend, by analogy with the rectum, for, in a discussion on the etiology of rectal stricture at the Surgical Society of Paris, he mentions how he thinks valvular or thin-edged strictures form near the anus, viz.: by spasmodic contraction of the upper fibres of the external sphincter provoked by ulcer or fissure below, at the verge of the anus, which thus leads to a permanent thread-like contraction. But he goes no further than the external sphincter, as his words show: "un chancre, une ulcération anale se produit, une fissure lui succède,—puis la contraction du sphincter. Le rétrécissement finit par être constitué par les fibres supérieures du sphincter, qui forment une véritable valvule."—*Bull. de la Soc. de Chirurg. de Paris*, 1873, p. 12.

<sup>2</sup> "The English people," says Goldsmith, "are afflicted it is true with neither famine nor pestilence, but then there is a distinct disorder, peculiar to the country, which every season makes strange ravages among them; it spreads with pestilential rapidity, and infects almost every rank of people; what is still more strange, the natives have no name for this peculiar malady though well known to foreign physicians by the appellation of epidemic terror."—*Citizen of the World*, Letter 69.

<sup>3</sup> Mollière, *Traité des Maladies du Rectum*, Paris, 1877, p. 320.

stricture. Horace Walpole furnishes similar evidence in one of his letters. He warns a friend, who is about going to Bath for his health, not to fall into the hands of a notorious practitioner of that place who always found his patients affected with contraction of the lower bowel and set them to introducing bougies. His friend in response warns Walpole not to joke about serious matters, for he had already consulted Mr. ———, who had actually found an obstruction in his bowel that caused all his symptoms, and that he was already getting better under Mr. ———'s skillful use of an instrument which he was inserting daily.

Marshall Hall in one of his published lectures<sup>1</sup> relates the case of a young medical friend who had been nine weeks under his roof, and in whom he had never suspected any disease of the bowel, who went to Bath and met there a young surgeon who passed a bougie and fancied he discovered stricture of the rectum. The bougie was inserted daily for several weeks, causing much pain and irritation. Dr. Hall subsequently took his friend to Sir Charles Clark, an eminent surgeon of that day, who examined him and found no stricture. The bougie was relinquished, and from that time "the factitious disease of the rectum, for such it was, was forgotten."

It is a remarkable fact that there is little if any evidence concerning either spasmodic or fancied stricture of the rectum to be found in the surgical literature of the Continent. The Germans and French scarcely allude to spasm, except as a complication of organic narrowing, and then with no emphasis or precision; and by the latest French authorities, Mollière<sup>2</sup> and Trélat, the existence of pure spasm as a cause of rectal stricture, except where the gut is in the grasp of the external sphincter, is formally denied.

But by English authors the subject is handled with less decision. One of the most recent and best of them, Mr. Allingham, bases an opinion as to the frequent presence of spasm, *as complicating organic stricture*, upon the most positive clinical experience I have found recorded anywhere.

"There are, no doubt," says he, "many cases of stricture in which there is very little deposit and much spasm; and there are, on the other hand, cases where much obstruction exists but very little spasm. A patient under my care at St. Mark's had a stricture so tight that I could not make the point of my little finger enter it; on putting her under the full influence of chloroform I could get two fingers through without difficulty."<sup>3</sup>

Admitting, not without some hesitation, Mr. A.'s first allegation, which is possibly somewhat influenced by English traditions, I am forced to confess that I have never felt any rectal stricture like that of this woman, and should suspect the presence of hysteria in the case, for it would seem that an exception to the rule ignoring pure spasmodic stricture must be made

<sup>1</sup> Lond. Med. Gaz., 1837-38, vol. i. p. 40.

<sup>2</sup> Art. Rectum in *Dict. Encyclopédique*, by Trélat and Delens.

<sup>3</sup> *Fistula, Hæmorrhoids, Painful Ulcer, Stricture, Prolapsus, and other diseases of the Rectum, their diagnosis and treatment*, by William Allingham, etc. etc., 2d ed., Phila., 1873.

in favour of this extraordinary disease, which so often defies all our rules. I have seen continuous spasm of the *voluntary* muscles of the leg and foot simulating well marked talipes varus in a hysterical young woman; which disappeared under the influence of chloroform, but always returned. She ultimately submitted to division of the tendo Achillis in one of our hospitals, on which the local malady returned no more. Are we justified in assuming that similar continuous spasm of *involuntary* muscle may exist? Jaccoud records a case of fecal vomiting which occurred in his wards at the Lariboisière, in 1867, in a young woman who was admitted with hysterical convulsions. For eight days this person, after the convulsions ceased, at least once, sometimes twice, in the twenty-four hours, vomited veritable feces, dense, solid, cylindrical, of a brown colour, and with the normal fecal odour, coming evidently from the large intestine. Jaccoud witnessed the act himself, and so also did Dieulafoy, his *interne*, and he characterizes it as actual defecation by the mouth. Apart from the passing disgust which followed the act, the patient ate as usual, and continued in her ordinary health, except in the absence of normal action of the bowels. At the end of the eighth day the hysterical convulsions returned, and, coincidently, the feces resumed their natural route. All possibility of deception seems to have been rigorously excluded. Within a fortnight this woman was seized with grave typhoid fever, and died. Careful examination of the body disclosed no mechanical obstruction whatever in the intestinal canal. The ileo-cæcal valve was normal.

Jaccoud concludes from this case that the ileo-cæcal valve may be forced, and true stercoraceous vomiting take place, and that occlusion by pure intestinal spasm—the *passio iliaca* of the ancients—is a reality; but he knows of no recorded instance of its occurrence in a male, and believes that it is only possible in a hysterical woman, and that even this is excessively rare. He considers also that this case demonstrates the possibility of reversed or anti-peristaltic contractions of the intestinal muscles, and with sufficient force to produce vomiting of feces.<sup>1</sup>

Allingham,<sup>2</sup> it will be noticed, distinctly refrains from asserting the existence of stricture from spasm alone; it must be associated, he assumes, with some organic change in the walls of the bowel. Curling<sup>3</sup> is silent on this topic. Quain,<sup>4</sup> elsewhere so judicious in his method of handling his subject, is singularly unsatisfactory in his remarks on spasmodic contraction of the bowel. His cases (86, 87, and 88, p. 299) are fair examples of what I have called phantom stricture, and are entirely inconclusive as regards spasm as the cause of obstruction.

But, amongst the English authors in the earlier part of the century, we

<sup>1</sup> Pathologie interne, 5th ed., Paris, 1877, vol. 2d, p. 271.

<sup>2</sup> See his last edition, London, 1879, p. 261.

<sup>3</sup> Observations on the Diseases of the Rectum, 4th ed., Lond., 1876.

<sup>4</sup> Diseases of the Rectum, reprint, New York, 1855.

find the possibility of pure spasmodic stricture very positively asserted, notably by Travers, Howship, and O'Beirne, and, before them, by White, of Bath.

Travers, in his paper "On Local Diseases termed Malignant,"<sup>1</sup> under the head of "rectum," makes this passing remark: "Spasmodic strictures are very common, particularly in women, and often mistaken; their feces, when solid, having the narrow, ribanded, and sharp-edged figure; they are curable by the temperate use of the bougie and cold-water clysters." This rather dogmatic utterance—the surgical style of the period—is evidently based upon cases, not too closely studied, of anal fissure causing spasm of the external sphincter, or of reflex uterine irritation—possibly hysteria.

Howship<sup>2</sup> asserts distinctly the existence of "permanent spasmodic stricture of the colon," but gives no positive proof of it; and advocates as a remedy the very slow injection of some warm fluid into the bowel in large quantity. His first case (p. 12), in a boy of ten, was evidently one of invagination; a tumour, not fecal, could be distinctly felt in the left iliac region, and this tumour gave way and disappeared under the slow injection, and recovery followed. His other illustrative facts are equally inconclusive.

In his best case<sup>3</sup> a stricture was found, after death, two inches in extent, with an opening scarcely admitting a goose-quill, situated about seven inches above the sphincter, in a man of 56, long ill with chronic diarrhœa, and described as dying finally of thoracic "inflammation." The colon was found largely dilated with soft feces. The rectum was at once removed, injected with a saturated solution of alum, and plunged into alcohol. In two weeks, when thoroughly hardened, "the feces were washed out, and a portion was cut out of its side above the contraction, to expose the healthy mucous membrane entering the stricture." The preparation was then mounted for the museum, as an undoubted specimen of "stricture from permanent spasm." He says, in describing it, that there is a "total absence of effused matter, intestinal deposit, or other effect of disturbed vascular action." But this specimen was not minutely studied when fresh; the constricted portion was not even laid open horizontally, and certainly not subjected to microscopic examination. I am forced to suspect that, in his anxiety to secure a good preparation for the museum demonstrating, as he thought, the truth of his preconceived theory of spasmodic stricture—for which he had a remedy, *i. e.*, the prolonged injection of warm fluids, Howship involuntarily jumped at his conclusion. The evidence hardly justifies his assertion as to the total absence of interstitial deposit, and we cannot accept this very unlikely condition as proven. There

<sup>1</sup> Med. Chir. Trans., vol. xvii. p. 336, London, 1832.

<sup>2</sup> Practical Remarks on Spasmodic Stricture, London, 1833.

<sup>3</sup> Discrimination and Appearances of Surgical Diseases, London, 1840, p. 242.

is no stronger proof of "permanent spasm" in any of Howship's cases than in this.

One of the most candid and able of the English authorities who wrote about this time, Herbert Mayo,<sup>1</sup> says of purely spasmodic stricture, "the cases I have met with and have considered of this nature have been anything but satisfactory;" and, in confirmation of this opinion, he appends (p. 155) a description of one such case, which affords a good illustration of the vague and unscientific evidence on which the existence of an imaginary disease may be assumed to account for symptoms of intestinal torpor in a nervous dyspeptic; in short, it is an example of phantom stricture.

Bushe,<sup>2</sup> "after long doubt as to whether there was such an affection as functional or spasmodic stricture of the rectum," at last met with two cases; one in "an exceedingly nervous lady," and another in a dyspeptic and costive gentleman. The strictures could only be felt when the patients were in the erect position, and bearing down forcibly. By this manœuvre he was enabled to insinuate the tip of his finger into a portion of the bowel "which was considerably contracted." Now, there is nothing easier, in my experience, than to get the sensation of entering a contraction with the end of the finger when it is being forced upward into the rectum whilst the patient is bearing down upon it. Anything short of a distinct grasping of the finger by a ring that embraces it firmly on all sides is likely to be illusory. One of Bushe's cases was cured by laxatives, and the bougie, in two months; and "the other recovered in three weeks," under the same remedies. I am unable to resist the suspicion that they were both phantom strictures.

Another writer who, by his plausible style and strong assertions, has aided largely in influencing professional opinion in favour of the belief in spasmodic stricture of the rectum, and of the bougie as its remedy, is O'Beirne.<sup>3</sup> This surgeon asserts that he "discovered," whilst treating tetanus by tobacco enemata, that the upper part of the rectum is "in a continual state of spasm;" and found, by subsequent experiment, that the rectum, as a rule, under all circumstances, so far from being open and relaxed, in accordance with common belief, is, on the contrary, habitually "firmly contracted and closed" (p. 4), especially at its upper extremity, where it joins the colon, at which point, he avers, there is a distinct *annulus*, or contraction, through which instruments pass "as if through a ring" (p. 7). He propounds the theory that the especial use of this "sphincter" is to resist the further progress of the feces which accumulate in their "natural reservoir, the sigmoid flexure," until the moment of defecation: He assumes, also, that spasm at this point is a common cause

<sup>1</sup> Observations on Injuries and Diseases of the Rectum, London, 1833.

<sup>2</sup> A Treatise on the Malformations, Injuries, and Diseases of the Rectum and Anus, New York, 1837.

<sup>3</sup> New Views of the Process of Defecation, etc., by James O'Beirne, Dublin, 1833.

of constipation and obstruction, which is best remedied; at the moment, by the use of the long rectal tube, *which it is allowable to urge onward with some force, increasing the pressure gradually* "until such time as the resistance is completely overcome" (p. 58); and that it is to be permanently cured by the bougie. He maintains, also, amongst his new views, that the large bowel is mainly supplied by cerebro-spinal or voluntary nerves;<sup>1</sup> and that the rectum is always empty.

O'Beirne's views were ably disputed, shortly after their publication, by his countryman Bushe,<sup>2</sup> at that time a professor of anatomy in New York; but they have, nevertheless, secured a hold upon the profession and maintained it with singular tenacity. Even now it will be regarded as heretical to speak of them justly, although his unwise recommendation to overcome spasm by the forcible pressure of an instrument has undoubtedly led to fatal results, as in the case related by Dr. Burne in his *Treatise on Habitual Constipation*.<sup>3</sup>

O'Beirne, who was evidently a sanguine and impulsive man, maintains his "views" in the style of an advocate. He employs neither the accuracy of method, nor the calm, cautious judgment of the scientist, but assumes facts—many of which are false—and uses arguments, many of

<sup>1</sup> I prefer to reproduce some of O'Beirne's peculiar views and statements in his own language, and assume that it will be unnecessary to formally controvert them:—

"In examining the bodies of a considerable number of persons who died of tetanus . . . I have ascertained that the rectum at its uppermost part is marked by an exceedingly narrow tight neck or constriction perfectly free from all appearance or feel of structural alteration, . . . obviously exhibiting pure and unexceptional specimens, not only of spasmodic, but of permanently spasmodic stricture" (p. 31). At p. 21 he had already spoken of "the upper extremity or *annulus* of the contracted rectum;" and, at p. 29, he remarks that "it is self-evident that the uppermost part or *annulus* of this intestine" (the rectum) "is the only portion of it that can be said to be engaged in obstructing the exit, and resisting the weight, volume, and propulsion of the contents of the sigmoid flexure." . . . He argues "that the motions of the large intestines, contrary to the opinion generally entertained, are not of an involuntary nature, but placed directly under the influence of the will, and subjected to that of the great source of voluntary motion" (p. 19). He says (p. 8), "I have also examined the rectum of healthy persons . . . at the moment when they felt a moderate inclination to go to stool, and have ascertained that the rectum is in a perfectly empty and contracted state."

<sup>2</sup> Op. cit.

<sup>3</sup> His friend Dr. Roots was called in great haste one morning to a gentleman in a state of partial collapse, suffering with violent abdominal pain. The surgeon in attendance reported that the symptoms arose from spasm, and informed the Doctor that the patient had two strictures of the rectum; that one had yielded; that the patient, having been out of town, had returned the previous evening, and that he, the surgeon, had endeavoured, as usual, to pass the bougie, but could not succeed on account of spasm of the gut; that he persevered, when, suddenly the patient complained of violent pain, and soon afterwards became alarmingly ill; that he had been with him all night and administered injections without avail; nothing except a little blood and mucus had been voided. The gentleman died during the day. The body was examined. A lacerated perforation of the rectum was discovered, with evidences of general peritonitis, but there was no stricture.

which are unsound, in support of a fancied discovery, and of a theory long since recognized as untenable. I need hardly add that his views are rejected by the best authorities at the present day.<sup>1</sup>

But the English writer who seems to have done more than any other to establish a belief in spasmodic stricture of the rectum, is White, of Bath. His first publication, in 1809, was evidently inspired by the much quoted essay on "the scirrhus-contracted rectum" of Sherwin, the earliest English writer on this subject.<sup>2</sup> White's second edition of his work<sup>3</sup> (I have been unable to get access to a copy of his first edition) contains 28 cases of what he designates, after Sherwin, "scirrhus-contracted" and "contracted" rectum. Of these, sixteen are within three inches of the anus, and two between three and four inches. In the effort to make out a distinction between malignant and benign strictures, a distinction which Sherwin had not recognized, White propounds a theory that there is a class of "simple strictures" which constitute the earliest stage of the "contracted rectum," in which, if discovered early enough, the disease is curable by the bougie. Taking the views of Everard Home on spasmodic stricture of the urethra, which have been long recognized as untenable, as his authority, he assumes a similar etiological origin for rectal strictures, which, he asserts, owe their existence, not to traumatism, nor to inflammatory or ulcerative changes in the mucous membrane of the bowel, but to *spasm* of its muscular coat, caused, in the first instance, by the contact of hardened feces in chronic constipation, and located, by preference, at or near the junction of the colon and rectum. These "simple strictures" are, therefore, beyond the reach of the finger, and recognizable only by the bougie, the use of which he also advocates very strongly as their proper remedy. "If," says he, "on introducing the finger, neither stricture nor induration can be discovered, a large-sized bougie must then be introduced and passed up as high as the colon, *which will be readily done if there be no obstruction in the passage*" (p. 26). Under the head of Treatment he says: "By degrees the bougie may be suffered to remain eight or ten hours at a time, with little or no inconvenience to the patient, and inserted daily" (p. 49). In a subsequent publication, entitled *Further Observations on Stricture of the Rectum, with Remarks on the Opinions of some late writers, etc.*, published also at Bath, in 1822, the tone of the writer is less modest and more polemical. This work contains evidence of successful practice in accordance with the new theory, in the form of assertions of great experience and skill in finding strictures in cases where

<sup>1</sup> "O'Beirne a décrit, sous le nom de sphincter supérieur, la portion de la couche de fibres circulaires que précède l'ampoule rectale, mais son épaisseur est trop faible pour qu'on puisse lui conserver ce nom qui se rattache, d'ailleurs, à une théorie de la défécation qui n'est plus admise."—E. Delens, *Dict. Encyclopedique*, 3 eseriè, t. ii. p. 672, Paris, 1874.

<sup>2</sup> *Memoirs of the Medical Society of London*, vol. ii. 1787.

<sup>3</sup> *Observations on Stricture of the Rectum*, by W. White, M.R.C.S. Bath, 1815, 2d ed.



others had failed, and in a more confident style in answering objections raised against his theory and practice by "late writers." Thus, he criticises Mr. Copeland and Sir Charles Bell for speaking doubtfully as to the diagnosis of strictures situated beyond the reach of the finger (p. 4); and derides Mr. Shaw for hinting that the promontory of the sacrum may be possibly mistaken for a stricture, clinching his position, in a rather triumphant tone, with the following query, as an *argumentum à posteriori*: "I should be glad to know why so many persons have been completely relieved from the most distressing symptoms by the use of the bougie, when all other means had failed, if no real obstruction had existed in the intestine?" Certain doubts expressed by "late writers" as to the great frequency of spasmodic stricture are answered by copious extracts translated from Boyer's famous essay on spasmodic contraction of the anus from fissure, which had appeared shortly before;<sup>1</sup> and White adroitly assumes that Boyer's array of facts and arguments concerning spasm of the sphincter ani confirm his own purely theoretical views as to the frequency of spasmodic stricture higher up in the bowel.<sup>2</sup>

White was evidently one of a type, of which we are rarely without instances in the profession, of men who are borne along by their own fancied discoveries to illogical conclusions, and who, like O'Beirne, whose theories were equally fanciful, serve only in the end to darken counsel by words of doubtful wisdom. He appears to have possessed little accurate clinical knowledge, but evidently much ability and great power of persuasion; and addressing the public rather than the profession in his writings, he secured a large following and, no doubt, much profit. Whilst we still recognize the traces of White's plausible but erroneous argumentation, the following quotations will explain why his views and opinions, once so popular, are now of no value, and why his name is so entirely lost to science:—

"It has so happened that in the course of an extensive practice very few cases of the simple form of constriction have occurred so low down in the rectum as to be within reach of the finger. And I can positively assert that the disease has been frequently overlooked, when the rectum has been subjected to an examination by the finger only. So seldom does simple stricture take place within reach of the finger, that on looking over a list containing one hundred and eighteen cases, I do not recollect meeting with half a dozen out of that number that were within reach. . . . It was, therefore the disease occurring so high up in the passage, connected with the circumstance of so many persons complaining of habitual costiveness from an early period of life, which induced me to think that

<sup>1</sup> In the *Journal Complémentaire des Sciences Médicales*, Nov. 1818.

<sup>2</sup> He pushes his assumption still farther; witness the following: "It does not, however, appear from the preceding observations of M. Boyer, that he had any idea of spasmodic contraction of the anus being connected with stricture higher up the rectum, or occurring as a consequence of it; but he seems to consider it as a primitive affection. Whereas, in all the cases that have come under my notice, the complaint has always been attended by stricture some way higher up the rectum, except in one instance."—*Op. cit.* p. 32.

the passage might possibly, in such instances, be naturally too narrow, at some particular part, to allow the feces to pass with their natural freedom; and which might lay the foundation for the formation of stricture" (pp. 6 and 7).

The last paragraph is quoted, by the author himself, from a former edition, which explains the modesty of its style; but he assumes in the later publication that this theory has been amply confirmed by his statements and arguments, in despite of the objections raised by the "late writers."

Does not this curious vagueness, both in stating premises, and in reasoning from them, justify the suspicion that a very large proportion of White's "one hundred and eighteen cases" must have been phantom strictures?

Assuming a judicial position, and rejecting as far as possible all personal preconceptions and logical fallacies, we must admit, I think, that, except, perhaps, in certain rare forms of hysteria and, possibly, of cerebro-spinal lesion, there is no positive evidence of pure persistent spasm of unstripped muscle in any part of the intestinal canal. Those who hold the opposite have assumed its existence, as we have seen; they have not demonstrated it; consequently their opinions and deductions are based upon uncertain premises, and cannot be safely received.

As I have already intimated there is no serious writer on rectal stricture of recent date who formally maintains the idea of permanent spasm; its possibility is either absolutely rejected, or the subject is passed over in silence, as by Vincent, Sam. Cooper (1838), Nélaton (1859), Curling, Erichsen, Paget, and Gross, the last confining himself to the shrewd remark that "stricture is a disease much more frequently described than observed." The only exception I have discovered is Spence, of Edinburgh, who says: "The rectum may also be spasmodically contracted at some point, and for the time this state presents all the symptoms of stricture;" but he adds, "this is not a stricture," it is "just a functional disturbance caused by some disease in the neighbourhood."

The absolute rejection of persistent spasm as a cause of stricture, comes mainly from the French and Germans; the traditional prejudice being still recognizable, I think in the English, amongst whom the best authorities, as we have seen, avoid the subject. Thus Mollière<sup>2</sup> denies the existence of essential spasm except in the external sphincter. Trélat and Delens dismiss the question curtly, but courteously, with the remark that they are "disposed to dispute the existence of spasmodic strictures, notwithstanding certain English evidence in its favour."<sup>3</sup> Leichtenstern decides that

<sup>1</sup> Lectures on Surgery, Edin., 1876, p. 1123.

<sup>2</sup> *Maladies du rectum and de l'anus*, Paris, 1877, p. 273. "En dehors de la maladie décrite sous le nom de fissure à l'anus, il n'y a pas de spasme essentiel de l'extrémité inférieure du tube digestif."

<sup>3</sup> Pour qu'il y ait rétrécissement véritable du rectum il faut qu'il y ait diminution persistante du calibre de l'intestin par suite d'un épaississement ou d'une transformation de ses parois. Nous sommes d'après cela, disposés à contester l'existence du

"to-day the question of the existence of such an affection no longer calls for serious discussion."<sup>1</sup>

This conclusion has been reached slowly, and by a road that is plain. After pathology had been securely placed on the basis of anatomy and histology, the traditional opinions founded upon clever speculations by ingenious theorists have been gradually dropped, and the more logical method of simple observations and deductions has been adopted. The author last quoted says of the etiology of ileus :—

"As a healthy logical need made itself felt, the need of bringing, in the simplest way, and without the aid of obscure hypothesis, clinical observations into agreement with the lesions found upon the cadaver, more and more light was thrown upon its nature."

What modern methods have taught us concerning spasm in connection with stricture may be finally summed up in a few words.

The normal rhythmical succession of relaxation and contraction of the intestinal unstriped muscular rings, which constitutes peristalsis, has been studied, by means of electricity, by Duchenne de Boulogne,<sup>2</sup> and by Onimus and Le Gros.<sup>3</sup> They have established the possibility of local increase of intensity of muscular contraction, or tenesmus, and of local atony, or paralysis. Gowers,<sup>4</sup> in a series of experiments upon a male patient in whom absolute paralysis of the external sphincter had followed a local injury impairing the action of the ano-rectal nerve centre, without involving the cord, or the unstriped muscle of the rectum, found that the rhythmical action of the latter could be provoked, with certainty, in a reflex way, and succeeded in getting traces, by means of a manometer attached to a caoutchouc tube containing a small tin pipe, through which air could be injected and peristaltic action excited at will, when the parts were previously quiescent. Goltz, of Strasbourg,<sup>5</sup> felt the same rhythmical contractions in the dog, by means of the finger in recto, when cold water was suddenly thrown upon the animal's hinder parts. Dr. Chadwick, of Boston, who has studied the action of the so-called internal sphincter upon his own person, confirms these facts.<sup>6</sup> Gerard,<sup>7</sup> who has very recently

rétrécissement spasmodique, quoique H. Smith assure que le Musée de St. Bartholomew's Hospital renferme une preparation d'un rétrécissement du rectum dans lequel la coarctation porte sur une longueur d'un pouce et réduit a six ou sept millimetres le diamètre de l'intestin sans aucun épaissement des tuniques."—*Dict. Encyc. des Sciences Medicales*, 3me serie, t. ii. p. 727, art. Rectum.

<sup>1</sup> Constrictions, Occlusions, and Displacements of the Intestines.—*Ziemssen's Cyc.*, New York, 1876, vol. vii. p. 484.

<sup>2</sup> De l'électrisation localisée et de son application à la pathologie et à la thérapeutique, Paris, 1861.

<sup>3</sup> Traité de l'électricité médicale, recherches physiologiques et cliniques, Paris, 1872.

<sup>4</sup> "The Automatic Action of the Sphincter Ani," by W. R. Gowers, M.D., Assist. Phys. to Univ. Coll. Hospital, communicated by J. Burdon-Sanderson, in *Proceedings of the Royal Soc.*, vol. 26, no. 179.

<sup>5</sup> Ueber die Functionen des Lendenmarks des Hundes, *Pflüger's Archiv*, Bonn, 1874.

<sup>6</sup> V. Trans. Gynæcolog. Soc., vol. ii. ut supra.

<sup>7</sup> Des Corps étrangers du Rectum, Paris, 1879.

investigated the subject, says that the prolonged presence and pressure of a foreign body in the rectum may give rise to very powerful contractions capable of forcing the foreign mass upwards into the sigmoid flexure, even when the gut is over-distended by its bulk. This is directly inferable from the case of a prisoner in the galleys at Brest who died of acute peritonitis. At the autopsy there was found in the transverse colon a cylindrical conical box more than six inches long, five inches and a half in circumference, and weighing, with its contents (saws, files, money, etc.), nearly two pounds. It had been introduced through the anus, with its conical end upwards.<sup>1</sup> It would seem to be an established fact that, if introduced by its small end, a conical body will travel upwards—indefinitely; but if introduced with its base or large end upwards, it will remain in the rectum, whence it will be easily expelled. This is in accordance with what we know of peristaltic contraction.

These facts render us, to a certain degree, familiar with the mode of action of the unstriped muscular coat of the rectum, both in its normal state, and when abnormally excited; but they do not explain the possibility of stricture of the rectum from permanent spasm—for they confirm the law that relaxation must alternate with contraction. And here it is important to guard against the error of assuming that there is identity of action in the two kinds of muscle as regards the mechanism of this vital act. In the case of the young woman with hysterical talipes already mentioned, Brown-Séguard, who saw the case with me, explained the continuous spasmodic contraction in her leg muscles by the continued successive contraction and relaxation of the primitive fasciculi constituting the bulk of these muscles—as in normal muscular effort kept up in obedience to the will. In continuous spasm of the involuntary muscle of the intestine, can we correctly assume that the same mechanism is going on under the misplaced and perverted nerve force of hysteria? Physiology gives a negative answer to this question, for in unstriped muscle the stimulus to contract is not repeated in the same primitive fasciculus, save after a long interval of rest, but it is transmitted to the next succeeding fibres, so as to produce the characteristic vermicular motion of the intestine. Moreover, the fibres of unstriped muscle are not collected in masses, as in the voluntary muscles, but spread out in thin layers; and Matthias Duval<sup>2</sup> would seem to be justified in his recent assertion that tetanic spasm in unstriped muscle is an impossibility.

The question has been asked, How is it possible to demonstrate the existence of a persistent and purely spasmodic stricture? I know nothing that promises more than the test by anæsthesia. In the case I have quoted from Allingham, the spasmodic element is said to have disappeared under chloroform. I have never been able to satisfy myself in regard to

<sup>1</sup> Gaz. des Hôpitaux, 1861, No. 62.

<sup>2</sup> Nouveau Dict., Art. Muscle.

this phenomenon, and I am still uncertain how far the contractility of involuntary muscular fibre can be abolished by full anæsthesia. If Allingham's case is an example of the rule, then the question is answered for the rectum within reach of the finger, and it is safe to assume that spasm must occur here, if anywhere else in the intestinal canal; beyond the reach of the finger, we must still rely mainly upon subjective evidence, and this is certainly against the probability of persistent pure spasm.

The most recent histological study of organic stricture of the rectum<sup>1</sup> teaches us that hypertrophied muscular fibre is commonly present as one of the elements of thickening of the intestinal walls. This is satisfactorily explained by the increased efforts of the *detrusor* apparatus to overcome the increasing obstruction. It is a "hypertrophy of necessity," and not, as has been asserted, a result of spasm.

The cases I have now to relate presented symptoms of stricture from obstruction to the gut by pressure upon it from without. As the cause of obstruction subsequently disappeared, as well as the symptoms which had been produced by it, they may, in a certain sense, be brought into the category of phantom strictures. I have been able to find no distinctly described examples of rectal obstruction of this nature, although I am persuaded that the experience of gynæcologists must furnish similar cases.

CASE V.—Mrs. ———, an intelligent, well-nourished, and healthy looking lady, of 48, was brought to the city by her husband, with a letter from a highly respectable physician, asking advice for stricture of the rectum, of which she was supposed to have two—one at five inches from the anus, and a second, two inches farther up—for which bougies had been employed, "with much relief," for several years. The patient herself complained of habitual constipation, and "a sense of obstruction" in the lower passage, and she believed firmly that these symptoms were due to stricture. Latterly she had employed Hunyadi Janos water, but found its action harsh and unsatisfactory, and was anxious to submit to more active measures for permanent relief. As I could discover no stricture by the finger, I subjected the patient to a most thorough exploration under ether. Placing her in Sims's position, with the hips elevated, after stretching the sphincter, I was able to get a fair view of the lower two-thirds of the rectum, which was healthy and normal; and then the largest sized hollow bougie of pure caoutchouc was gradually passed fourteen inches up the bowel, and its extremity having been inflated to a diameter of at least two inches, it was slowly withdrawn without encountering any impediment whatever. It was again introduced to the extent of nine inches, and withdrawn, with the same result. As no rational symptoms of obstruction had existed at any time, nor any great distention, and as no tumour could be found in the left iliac fossa, or elsewhere in the pelvis or abdomen, I felt justified in giving a positive opinion that the patient had no stricture, and she returned home with detailed instructions as to the best method of securing natural action of the bowels.

<sup>1</sup> Malassez, Bull. de la Société Anatomique.

I saw this lady some months later, whilst on a visit to the city. Although not entirely free in the bowels, she was much better, and satisfied with the prospect of farther improvement.

In this case I made out a history of pelvic cellulitis six years before, which had been provoked by a long journey by rail, whilst suffering from uterine congestion coincident with interrupted menstruation at the commencement of the menopause. She had been called to what she supposed was the death-bed of a son. At the end of the journey she was taken with pelvic pain and distress, and confined to the bed, very ill, for the succeeding three weeks, at the end of which there was a free discharge of pus from the anus. From this she dated the symptoms of obstruction, and her suspicions of stricture. The experience derived from the following case, which I had seen with Dr. Quackenbos some years before, led me to express the opinion to this lady's physician that a stricture might have existed from the outside pressure of contracting bands of pelvic connective tissue left by the cellulitis and abscess, and that these had softened down and disappeared spontaneously.

CASE VI.—A young married woman, whilst menstruating, was chilled after dancing at a ball, and for some weeks afterwards suffered severely with pelvic pains and distress, accompanied by fever. Some eight months later I saw her, at the request of Dr. Quackenbos, with entire and prolonged obstruction to the bowels, which had resisted the usual internal remedies. She had seen Prof. Alonzo Clark, and he advised recourse to surgery. The patient was a well-nourished person, but at this time very much distended, having had no stool for ten days. By determined pushing, in exploring by the finger *in recto*, I discovered what felt to me like the sharp edge of a linear valve-like constriction occluding the gut at a point just about as high as I could reach whilst my friend was pushing my elbow, and the patient was bearing down with all her force. By persevering manœuvres, first a catheter, and then a rectum-tube was got beyond this valvular impediment, and then, by injections of warm water, some passage of diluted fecal matter was secured, and, little by little, entire relief. The patient was taught, after a time, to relieve herself in this way, and succeeded, as I was informed, quite well.

During the following year, whilst visiting another patient with Dr. Q., I inquired after this lady, and received an entirely favourable report, with an invitation to see her and examine her, which I did. She reported herself well, and had the appearance of perfect health, and was still using the injections, but irregularly, as the necessity for them had ceased. On exploration I was entirely unable to discover any traces of the sharp-edged projection which had obstructed the bowel so completely, and, from her report of easy and natural stools, I was forced to the conclusion that, as we had suspected, the obstruction had been caused by a contracted band of neoplasm organized outside of the gut at the time of the pelvic inflammation, and that this band had gradually developed the yielding quality of normal connective tissue.

CASE VII.—Broca<sup>1</sup> describes the case of a woman of 50, who had a stricture of the rectum at about four inches from the anus, produced by what was to him

<sup>1</sup> Bull. Soc. Anat., Paris, 1852, p. 49.

a novel cause. The uterus, which was large and knobbed, probably from fibromata, had contracted adhesions, posteriorly, with the rectum, and there were two narrow bands of plastic exudation, extending backwards, one on either side, so as to encircle and constrict the rectum. He adds the surmise that most valvular strictures are the result of a similar mechanism.

The following case is not one of stricture, but it illustrates an occasional cause of rectal obstruction in women, which, by eluding detection, might be mistaken for stricture.

CASE VIII.—A young lady of 25, or thereabouts, was brought to me from the country by her mother, with the complaint that she could not relieve her bowels whilst sitting in the usual position, and had been gradually compelled to resort to the use of a bedpan, and could only secure a passage whilst lying upon her back after taking an enema. I could find nothing wrong on exploring the rectum as she lay upon the side, but, induced by her strong conviction of the presence of an obstacle to examine the bowel with the finger whilst she was in the squatting position, I recognized that a globular tumour, which I took for the fundus of the uterus, was, in this position, forced firmly backwards into the hollow of the sacrum so as to completely obstruct the passage through the rectum. This tumour proved, on further examination, to be a fibroma, estimated to be about the size of a billiard ball, which had developed in the posterior wall of the uterus.

The last case which I shall relate, and I offer it as a contribution to the obscure subject of rectal syphilis, would seem to demonstrate that the new growths developed in tertiary syphilis may cause stricture of the rectum; and, also, that stricture arising from this cause may disappear entirely under anti-syphilitic treatment.

CASE IX.—Mr. D. B. B., 38, married, a cachectic person with a dark complexion, born near the tropics, came to the city in February, 1878, seeking relief for a chronic looseness of the bowels, with inability to retain his stools, and a painful condition of the lower bowel and anus.

Mr. B. had contracted syphilis at 25, and had taken mercury largely, but irregularly. He was overtaken by diarrhoea in China, at 31, and shortly after this, nodes appeared upon the shins. The diarrhoea became chronic, and interfered with the further use of anti-syphilitic remedies. At 35, at the Hot Springs of Arkansas, he was very thoroughly treated by inunction, after which he improved greatly, but rectal symptoms still persisted: he had frequent loose stools with occasional incontinence, and with tenesmus, passing, usually, both blood and mucus. He was examined, subsequently, in San Francisco, and said to have "piles," some of which were cut off, but it was ultimately decided that he had stricture of the rectum. At 37 he was subjected to treatment in Washington, D. C.: some "external tumours" were cut off; a "stricture" was cut, a "pouch" slit up, and a "fissure" divided—with some relief. When examined in February, 1878, the year following, in New York, we found unmistakable evidence of gummatous infiltration of the tissues at the lower end of the rectum, including the sphincters, in short, the forms of disease so fully described by Fournier under the name of *syphilome ano-rectale*. The note of the case taken at this time, says: "The circumference of the anus especially on the right side, is thickened, has a peculiar, inelastic, softish-hard feel, and is covered by a shining, livid, integument; the infiltration ex-

tends towards the right buttock. On the left side of the anus are two similar, flattened, livid surfaces, of the same consistence, but more circumscribed. From each of these surfaces lumps have been cut away, and the wounds have healed; but they are now growing again. The finger inserted into the gut encounters a hardened, infiltrated condition of its walls, velvety in feel on the mucous surface, which, at points, is eroded and thickened, but not ulcerated. There is no contractile force in the infiltrated sphincter, and this explains the incontinence of feces from which the patient has suffered. The diseased condition extends about two inches upwards into the gut. The finger when withdrawn is covered with blood and mucus. At the verge, posteriorly, is an ulcerated gap, which remains since the incision of the "fissure." As anti-syphilitic remedies had always irritated his bowels, the patient was given the modified Zittman's decoction, in mild doses, guarded by bismuth; the treatment being fortified by frictions to the skin with the oleate of mercury.

On the 2d of May, when he next visited the city, a decided improvement is noted, both in the patient's general and local condition; but I discover a distinct contraction, which admits the second joint of my index finger with slight effort, situated at the level of the upper border of the external sphincter. Calomel fumigations were added to the treatment.

Mr. B. did not again return to the city until the 3d of September following. On the same night, before I had seen him, he was seized with a sudden sharp abdominal pain, attended by retching of bloody mucus. The pain, which was excessive, was controlled by morphia, but symptoms of peritonitis, followed promptly by collapse, terminated in death in twenty hours after the first seizure. As there had been repeated vomiting of blood, and yellow fever was prevalent in the south at the time, the patient's sudden death at a hotel made it proper for the health officer to institute a formal inspection of the body, and this was done, very thoroughly, under the auspices of Prof. Janeway, aided by Prof. L. A. Stimson. A perforating ulcer was found in the upper part of the ileum. Three flat, smooth cicatrices were discovered in the neighbourhood, and, also, two points of stricture of the ileum, the narrower of which would just admit the tip of the little finger. The appearance of the parts at the anus indicated great improvement since the earlier recorded examinations. There was but little remaining evidence of infiltration of the sphincter or bowel walls, no remains whatever of stricture, and but slight traces of former disease were recognized on the most careful inspection by these gentlemen at the time, and by Dr. Keyes and myself subsequently, of the parts as preserved. Dr. Keyes, who aided me in this case, was told by the sister of the patient that he had been several months during the summer under the care of a physician, in Philadelphia, for his persistent abdominal pains and bloody stools, and that he determined to come on again to this city in consequence of a sudden and decided increase in their severity.

I think that a careful review of the history of this case, with its culmination, after the exacerbation last mentioned, in fatal perforation, and the appearances presented after death, justify the opinion that it was one of inveterate syphilis expending its violence mainly upon the intestinal canal. The cases recorded by Leichtenstern, Klebs, and others,<sup>1</sup> have made it next to certain that syphilis is competent to produce ulceration of the small

<sup>1</sup> v. Ziemssen's Cyc., vol. vii. ut supra.



intestine; and cicatrized ulceration is, perhaps, the commonest cause of stricture. In this locality stricture from any cause is asserted by Dr. Hilton Fagge, in his excellent study of intestinal obstructions,<sup>1</sup> to be very rare; and if we admit the syphilitic character of the ulceration in this case, it will be, as far as I can learn, unique. It is noticeable that, even if the progress of the diathetic disease had been ultimately controlled by treatment, the tightness of the stricture of the ileum might at any time have caused fatal obstruction by lodgment of ingesta.

Again, there is evidence recently placed on record by Fournier, Trélat, and Malassez, that tertiary syphilitic infiltration about the rectum and anus may give rise to stricture in this locality. The present case tends to confirm this evidence, and to establish the fact of stricture from true syphilis. Finally, in the absence of ulceration, to which, strangely enough, this form of syphilitic infiltration does not, at least in the rectum, seem to be prone, and in the absence, consequently, of the contractile element of cicatrization, stricture from true syphilitic infiltration would seem, if this case has been correctly observed, to be curable by well-directed anti-syphilitic treatment.

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## ARTICLE II.

SARCOMA OF THE LONG BONES; BASED UPON A STUDY OF ONE HUNDRED AND SIXTY-FIVE CASES. By SAMUEL W. GROSS, A.M., M.D., Mütter Lecturer on Surgical Pathology in the College of Physicians of Philadelphia, and Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.

IN the number of this Journal for July, 1879, I considered the more important points in the general pathology and diagnosis of sarcoma of the long bones and completed the study of giant-celled or myeloid tumours. In the present paper I shall describe the remaining central growths along with those of periosteal origin, and compare them with the view of establishing their differential diagnosis.

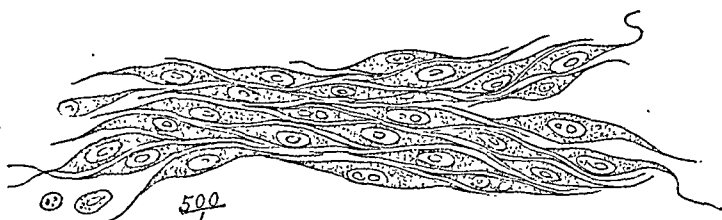
### 2. CENTRAL SPINDLE-CELLED SARCOMA.

Spindle-celled sarcomas, which are synonymous with the fibroplastic tumours of Lebert, the plasmomas of Follin, the fasciculated sarcomas of Cornil and Ranvier, the recurrent fibroid tumours of Paget, the fibronucleated tumours of Bennett, the albuminous sarcomas of Gluge, the fasciculated carcinomas of Müller, and, in their soft forms, with the medullary or encephaloid cancers of many authors, are next to the giant-celled tumours the most common of the myelogenic sarcomas of the long bones.

<sup>1</sup> Guy's Hospital Reports, vol. xiv. 1869.

The elements of which they are composed, and which have their analogues in the corpuscles of developing and newly-formed connective tissue, vary greatly in their morphology in accordance with the different stages of their development. In the fibronucleated growths they look as if they were merely naked nuclei of an elongated oval form. In the recurrent fibroid or fibroplastic tumours, they are oat- or awn-shaped, or made up of slender, delicate, elongated, nucleated spindle cells. In the typical spindle-celled sarcoma, as is shown in Fig. 1, which I drew from a section of a tumour of the head of the tibia, the cells are thick, and full, and plump, and provided with one or more large nuclei, while their bodies are drawn out at each end into a filamentous process, which is sometimes divided, and renders the cell so large that it may extend over one or two fields of the microscope. From these differences in size a distinction is made between the small spindle-celled and the large spindle-celled tumours. The dimensions of the elements, indeed, appear to exert a most decided influence upon the consistence and prognosis of the growth, since it is precisely the small-celled sarcomas that are more liable to be medullary and the more disposed to recur after extirpation and occasion metastatic deposits in the internal organs.

Fig. 1.



The cellular constituents are separated, and at the same time united, by a more or less abundant hyaline, slightly granular, or, as when the growth shows evidences of a higher degree of development, as happens in the fibrous sarcomas, fibrillated intercellular substance, and they interdigitate, that is to say, the extremity of one cell is received between two contiguous cells, so that a tissue results, which is made of bands or fasciculi of closely aggregated cells. These bands pursue a parallel course, interlace in every part of the tumour, or radiate from its centre towards the periphery so that, on section, groups of what seem to be small round cells, but which are in reality transverse cuts of fusiform elements, are seen to be surrounded by longitudinal bands of spindle-celled tissue.

Spindle-celled sarcomas are met with as smooth, or slightly nodulated, but rarely bosselated, spherical or ovoid tumours, which are limited by a capsule which is indifferently periosteal, or bony, or partly membranous and partly osseous. Their cut surfaces are generally smooth, glistening, and succulent, and of a white or grayish-white tint, even when the growth is soft and fluctuating. In many specimens the prevailing colour is rosa-

aceous. In others, the white or rosy surface is marked by yellow areas, which are denotive of fatty changes, or by dark red or brown spots, which indicate points of increased vascularity or minute extravasations of blood. Their consistence is, for the most part, firm and elastic, rarely soft, and now and then positively dense and hard; and they tear apart with a fibrous grain.

Retrograde changes and accidents are not common. In one case small softening cysts were interspersed throughout the mass; in three extravasation-cysts were present; in one the large spindle-celled tissue was separated by islets of cartilage in all degrees of development; while, in three examples, calcification, or ossification, was progressing. It is interesting to note, in connection with what I have previously stated in regard to the malignity of osteoid myeloid sarcomas, that one of these cases succumbed from local recurrence and metastatic deposits.

The vascularity of these tumours is not pronounced. In the case of Demarquay, recorded by Lebert,<sup>1</sup> the firm, elastic growth, which was as large as a turkey's egg, pulsated and was the seat of a blowing sound, and yet the gross appearance of the tissue bore no evidences of the inordinate development of vessels, the cut surfaces varying in colour between pale yellow and yellowish-rose. In an instance reported by Richet,<sup>2</sup> there were also pulsation and a bruit de souffle. That the bloodvessels are, however, occasionally much enlarged, and the seat of sarcomatous degeneration, if not actually the starting points of the disease, is shown by the case of Mr. Adams,<sup>3</sup> and by the following abstract of an example of hemorrhagic chondroid spindle-celled sarcoma of the lower end of the femur, recorded by M. Urdy.<sup>4</sup>

CASE I.—A farmer, aged 32 years, experienced, in May, 1869, lancinating pains in the region of the knee, and, six months subsequently, perceived a small tumour on each side of the articulation. At first they grew slowly; but at the end of nearly three years, when they had united on a level with the inferior third of the femur, their volume was so large as to require the man to leave work and go about on crutches. On admission into the Hôpital de la Pitié, Feb. 13, 1872, the tumour, which was ovoid, with its large extremity below, was found to extend from four inches below Poupart's ligament to the upper part of the leg. Its largest circumference was 0.85 m. or about thirty-three inches; its consistence was soft and fluctuating, especially below and externally, or at a point which corresponded to the blood cyst, and it was the seat of a dull pain which was increased by pressure; the lymphatic glands were normal; the motions of the knee were abolished; and progression without crutches was impossible. The skin was stretched, and the subcutaneous veins were voluminous.

On the 2d of March, M. Labbé amputated the thigh about an inch and a half below the great trochanter, and death ensued from purulent infection on the eleventh day. All the muscles were inserted into the periosteal capsule of the tumour, which was irregular, bosselated, of a dull white colour, hard at some points, and soft and fluctuating at others. At the outer part was a cyst, which

<sup>1</sup> *Traité d'Anat. Path.*, vol. ii. p. 591, and Atlas, plate clxx. fig. S.

<sup>2</sup> *Bull. de la Soc. de Chir.*, vol. v. ser. 2, p. 21.

<sup>3</sup> *Trans. Path. Soc. London*, vol. v. p. 254.

<sup>4</sup> *Bull. Soc. Anat. de Paris*, ser. 2, vol. xvii. pp. 132 and 180.

contained six pints of a brown chocolate-coloured fluid mixed with fibrinous clots. Its inner surface was irregular, bosselated, and lined with decolorized coagula. The femur was fractured just below the trochanter, and a button of the morbid tissue projected into the medullary canal. The tumour was a large spindle-celled sarcoma, intermixed with islets of cartilage. The articular cartilage of the femur had undergone sarcomatous degeneration, but was not perforated.

Spontaneous inflammation, ulceration, and fungous protrusion had not occurred in any of the cases that I have collated. In one, recorded by Birkett,<sup>1</sup> incision into the tumour was followed by the formation of a large, fungous, bleeding, and sloughing growth. Insult of this nature is not, however, necessarily attended with so untoward an event, since in the case of Bickersteth,<sup>2</sup> a free incision closed promptly and permanently. Indeed the healing process does not appear to be retarded by the presence of spindle-celled tissue, as, in the case of Birkett, the tibia, which was broken at the site of the tumour, was completely consolidated in six weeks.

Central spindle-celled tumours are far more common in the shafts of the long bones than are myeloid sarcomas, that locality having been occupied once in every three and three-fourth cases by the former, and only once in every seventeen and one-half cases by the latter.

Their seat in 16 examples was in the

Tibia, upper epiphysis,	in 2 cases,	shaft, in 2 cases.
Femur, lower	" " 5 "	" " 1 "
Fibula, "	" " 1 "	
Ulna, upper	" " 1 "	
Humerus, upper	" " 2 "	shaft in 1 case.
	Humerus, seat unknown	" 1 "

Eleven cases occurred in males and five in females, and four were traceable to traumatism.

The age at which they were first noticed was, respectively, 10, 19, 20, 21, 24, 29, 31, 32, 34, 38, 41, 41, 51, 56, 61, and 68 years, the average being 36 years. Hence they are not so frequent before the thirtieth year by 29 per cent as are the giant-celled sarcomas.

The growth of spindle-celled tumours is, on the whole, not so rapid as that of myeloid sarcomas, although in some cases they increase very quickly, and attain, for example, a circumference of nineteen inches in one year,<sup>3</sup> or of thirty-three inches in thirty-four months.<sup>4</sup> These were instances of hemorrhagic sarcoma. As an illustration of slow growth, the case recorded by Dr. Green<sup>5</sup> may be mentioned, in which the tumour acquired the size of an orange in two years, and was composed of moderately firm pure spindle-celled tissue. The rate of increase and volume appear, therefore, to depend upon the consistence and integrity of the tissue; the

<sup>1</sup> Guy's Hosp. Reports, ser. 3, vol. x. p. 159.

<sup>2</sup> Trans. Path. Soc., London, vol. xvi. p. 227.

<sup>3</sup> Horteloup, Bull. et Mém. de la Soc. de Chir. de Paris, vol. ii. p. 676.

<sup>4</sup> Urdy, ante. <sup>5</sup> Trans. Path. Soc., London, vol. xx. p. 277.

firmer variety being marked by chronicity and moderate dimensions, while the soft, medullary, or encephaloid variety increases quite rapidly, and is far more bulky, particularly if it be the seat of extravasations of blood.

Spindle-celled sarcomas evince little disposition to break through their investing capsules. Hence the associated and surrounding tissues are rarely the seat of local infection, while metastatic deposits, as will be shown presently, occurred in only three instances. The medulla of the shaft above the seat of the tumour was invaded in one case,<sup>1</sup> while in one example<sup>2</sup> the cells of the articular cartilage were undergoing sarcomatous proliferation, but the joint itself was intact. In the instance recorded by Volkmann,<sup>3</sup> the cartilage of the head of the humerus had undergone sarcomatous degeneration, and was the seat of sieve-like perforations. In the case of Horteloup,<sup>4</sup> the enormous tumour of the olecranon process had projected masses into the elbow-joint, and dislocated the head of the radius forwards; and in the case of Grohe,<sup>5</sup> the joint was invaded. In not a single instance were the associated lymphatic glands involved, either as the result of irritation or invasion by the disease. Hence the contrast in this respect between spindle-celled and giant-celled sarcomas is most striking.

The malignity of spindle-celled sarcoma is demonstrated by the following cases, which represent 23.07 per cent. of the whole number:—

CASE II.<sup>6</sup>—A girl, aged 10 years, underwent amputation at the shoulder-joint on account of a medullary sarcoma of the humerus, which was made up of fibro-nucleated tissue, and contained thin plates of bone. "The wound healed readily; but three months afterwards the disease returned in the cicatrix, which presented a tumour the size of a pigeon's egg. Thirteen days after, a soft bulky tumour appeared in the occiput, which increased until her death, two months afterwards. On dissection, medullary tumours were found surrounding the glenoid cavity, attached to the occipital bone externally, and causing caries of it, and also between that bone and the dura mater."

CASE III.<sup>7</sup>—A woman, aged 51 years, had suffered for eleven years from intermittent pains, which were aggravated by cold, at the outer part of the ankle. In April, 1867, she first noticed a swelling about three inches above the lower extremity of the fibula, which afterwards enlarged rapidly, and was attended with much pain. On the 25th of November, 1867, the lower four inches of the fibula were found to be involved by a smooth tumour, which was principally solid and elastic, but fluctuated at one point, and was tender on handling. The skin was tightly stretched and adherent over the mass; and at the most prominent point the cuticle was peeling, and the cutaneous capillaries were enlarged and tortuous.

The leg was amputated on December 3, or eight months after the growth was first noticed; but death ensued from pyæmia on the twelfth day. Two patches of "medullary cancer" were found in the upper lobe of one of the lungs; but as the primary growth "microscopically and to the naked eye displayed all the features of fibroplastic tumours," there can be no doubt that the secondary deposits were of the same nature.

CASE IV.<sup>8</sup>—A tailor, aged 36 years, consulted Professor Grohe on account of

<sup>1</sup> Urdy, ante.

<sup>2</sup> Langenbeck's Archiv., vol. xv. p. 563.

<sup>3</sup> Bardenheben, Lehrb. der Chir. und Operationslehre, 6th ed., vol. i, pp. 566 and 576.

<sup>4</sup> Bennett, On Cancerous and Cancroid Growths, p. 108. Edinburgh, 1849.

<sup>5</sup> Bryant, Trans. Path. Soc., London, vol. xix. p. 317.

<sup>6</sup> Urdy, ante.

<sup>7</sup> Ante.

<sup>8</sup> Grohe, ante.

a tumour of the lower end of the femur, of five years' duration. It was thought to be a malignant formation, although the skin and the inguinal glands were normal. Amputation was out of the question in consequence of lung complications, from which death ensued shortly afterwards. On section, the condyles of the femur were found to be replaced by a soft small spindle-celled sarcoma, which had extended into the knee-joint and the ham. Both lungs were the seat of metastatic growths, as large as the fist, and the bronchial glands were converted into a sarcomatous mass as large as a hen's egg.

Of the sixteen cases here analyzed, one<sup>1</sup> died of pneumonia without operation, the tumour, which was of two years' standing; and only four inches in circumference, having occurred in a man sixty-eight years of age. In the case of Grohe, death ensued in five years from general infection, without surgical aid. Of the remaining fourteen, thirteen underwent amputation, and one excision. In three of these there is no further history.<sup>2</sup> Of the other eleven, six died from the effects of the operation,<sup>3</sup> and in one there were metastatic deposits; one remained well for seven years, which was the date of the last report;<sup>4</sup> one was alive at the end of seven months;<sup>5</sup> one was doing well at the expiration of five months and a half;<sup>6</sup> one recovered from the operation, but died in five months from local and general infection;<sup>7</sup> and one was alive two weeks after amputation.<sup>8</sup>

The total duration of life from the first appearance of the disease until its termination after surgical interference, varied from five months to eight years, the average having been 37.2 months, which is three months less than the mean duration of life in giant-celled sarcoma. None of the cases, however, came under treatment as early as did the cases of the latter variety of tumour.

Central spindle-celled sarcomas usually declare themselves by spontaneous pain, that symptom having been the earliest manifestation of the affection in 60 per cent. of all instances. Attention was first directed to them by a tumour alone in 30 per cent. of the cases, and by simultaneous pain and tumefaction in 10 per cent. Pain appears to be uniformly present at some period. In its nature it is usually continuous and severe, and of a rheumatoid or gnawing nature; it is occasionally worse at night, and is aggravated by exercise and handling.

The skin is variously altered in 40 per cent. of all cases, being of a violaceous or purplish tint, tense and thinned, and adherent in about equal proportions.

The subcutaneous veins are enlarged in one half of all cases. Lymphatic involvement is never observed.

Spontaneous fracture, or fracture from very trifling causes, of the affected

<sup>1</sup> Coyne, Bull. de la Soc. Anat., vol. xiv. ser. 2, p. 106.

<sup>2</sup> Cases of Horteloup, Demarquay, and Adams.

<sup>3</sup> Cases of Urdy, Green, Bryant, Birkett, Kelly (Trans. Path. Soc., London, vol. xx. p. 266), and Volkmann.

<sup>4</sup> Birkett, Guy's Hosp. Reports, ser. 3, vol. x. p. 168.

<sup>5</sup> Reference mislaid.

<sup>7</sup> Case of Bennett.

<sup>6</sup> Case of Bickersteth.

<sup>8</sup> Case of Richet.

bone is met with in 44 per cent. of all cases, and is a symptom of value when considered in connection with other phenomena. Thus, if after the patient has experienced pain at a localized point for some months, the bone breaks, and a swelling develops more or less rapidly, the probabilities are greatly in favour of a sarcomatous tumour; but the particular variety of tumour will have to be determined by other symptoms, since this course of events occurs in the round-celled, as well as in the spindle-celled sarcomas.

The tumour itself has a globular or ovoid outline; its surface is generally even; its consistence is, for the most part, firm and elastic, with, possibly, one or more points of fluctuation. When its limiting capsule is bony, as happens in one-third of the cases, it may be densely hard; or, in the event of the cyst being very thin, or partly membranous, parchment-like crepitation may be elicited. On exploratory puncture, the trocar will be found to be fixed, or not move freely, and only a little blood will escape by the canula. In the hemorrhagic form of the disease, however, these signs will be reversed. Pulsation and other signs of aneurism are met with in only  $12\frac{1}{2}$  per cent. of all cases.

From these considerations it follows that a moderately large, painful, rather rapidly growing, fixed, globular, firm-elastic, smooth, non-pulsatile tumour, seated in the shaft or epiphysis of a long bone, which is probably fractured, at about the thirty-sixth year, associated, possibly, with discoloration of the skin, and with enlargement of the subcutaneous veins, but with absence of lymphatic involvement and deterioration of the general health, may be pronounced to be a central spindle-celled sarcoma.

The treatment of this class of tumours should be conducted upon the same general principles as those which govern the management of myeloid sarcomas.

### 3. CENTRAL ROUND-CELLED SARCOMA.

Of all the neoplasms of the bones, there is none about which so much confusion exists as those termed round-celled sarcomas by Virchow, embryoplastic tumours by Lebert, medulla-celled tumours by Robin and Nélaton, granulation sarcomas by Billroth, and encephaloid sarcomas by Cornil and Ranvier. Foerster included them among the juiceless carcinomas, and they were formerly regarded as encephaloid cancers. Even at the present day, they are described under the head of medullary cancer by Paget, Holmes, and others, the prefix medullary indicating that they possess the consistence and colour of the white substance of the brain.

The structure of this variety of sarcoma is usually very simple, consisting, as it does, mainly of spherical fragile cells, provided with a round or oval nucleus, and of the dimensions of the lymph or colourless blood-corpuscles, and contained in a homogeneous, dimly granular, or finely fibrillated matrix. In a word, round-celled sarcomatous tissue is made up of delicate capillary vessels, which are, however, less abundant than in

ordinary granulations, the spaces between which are filled by small, round, lymphoid cells, held together by a scanty, soft, amorphous intercellular substance. Hence their likeness to granulation tissue and to the medulla of embryonic bones, on which account the terms granulation sarcoma and medulla-celled tumour have been applied to them.

From these general features there are some histological variations. Thus in a tumour of the head of the tibia, I found that the intercellular substance formed a delicate reticulum of pale, transparent fibres, the meshes of which were occupied by a single round or ovoid cell, of an average diameter of  $\frac{1}{2300}$  of an inch, and containing a nucleus, the mean diameter of which was about two-thirds of that of the cell. When entirely freed from the corpuscular elements, the hyaline fibres, at many spots, appeared to proceed from a common centre, or nodal point, as is delineated at *a*, Fig. 2, which I drew from a partially pencilled-out section. The entire structure, therefore, was very similar to the cytogenous or adenoid tissue of the lymphatic follicles. This variety of round-celled sarcoma corresponds to the glious sarcoma of Virchow,<sup>1</sup> and is described by Rindfleisch<sup>2</sup> as lymphatic gland-like, or lymphadenoid round-celled sarcoma.

A still greater departure from the ordinary type of tissue, and it was met with in four of the cases which I have collected, is observed in the tumours originally classed by Billroth<sup>3</sup> as alveolar sarcoma, an illustration of the minute appearances of which is afforded by Fig. 3, copied from that

Fig. 2.

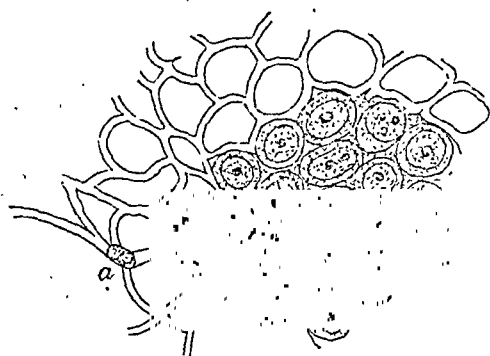


Fig. 3.



<sup>1</sup> Op. cit. p. 208.

<sup>2</sup> Langenbeck's Archiv, vol. xi. p. 224.

<sup>3</sup> Op. cit. 134.



observer. Roundish heaps of small cells, which look not unlike giant cells, are seen to be contained in the alveoli or spaces of a connective-tissue meshwork. At certain points the masses of cells are intersected by delicate bands of connective tissue, which are given off by the coarser trabeculae, and which divide the larger clusters into smaller ones. The formation of these fine fibrils is ascribed by Billroth to the condensation of the outer layer of the protoplasm of the cells, in which view he is upheld by Neumann.<sup>1</sup> Tumours which possess this structure are excessively vascular. In the case from which the illustration was taken,<sup>2</sup> it occupied the shaft of the tibia of a man, aged 29 years, was of two years' duration, and was characterized by marked pulsation, and a bellows sound. The telangiectatic tissue was found, after amputation, to be the seat of numerous extravasations of blood. The enormous production of new vessels has, therefore, led Dr. Jaffé<sup>3</sup> to regard alveolar round-celled sarcomas as being nothing more than plexiform angiosarcomas, the alveolation being due to the course pursued by the numerous vessels. He, moreover, traces the production of the sarcomatous elements to the proliferation of the nuclei of the vessels, and quotes numerous authorities who recognize this mode of genesis of sarcomatous tumours in various parts of the body. His deductions are based upon the study of a pulsating periosteal alveolar sarcoma of the iliac bone; and it is a striking fact that nearly all of the recorded growths of this nature, whether central or peripheral, were the seat of pulsation, and were often confounded with aneurism.

It will thus be perceived that the formation of an alveolar stroma in certain sarcomas of the bones is referred by Billroth to changes which take place in the cells, while Jaffé refers it to the course pursued by the bloodvessels of the neoplasm. That the latter do play an important part in the production of an alveolar structure there can be no doubt, and I am myself disposed to agree with Jaffé that the walls of the alveoli in the very vascular sarcomas are formed by the capillaries, and, with Weber,<sup>4</sup> that in the less vascular tumours the stroma is due to the obliteration of these channels and their conversion into solid fibres.

I have myself quite recently had the opportunity of studying this variety of morbid growth, for the specimen and the history of which I am indebted to Dr. T. H. Burchard, of New York.

CASE V.—A married woman, in excellent general health, and 24 years of age, came to the New York Dispensary, Oct. 18, 1875, on account of a very painful tumour of the right knee, which measured thirteen inches more in its greatest circumference than its fellow. There was no discoloration of the skin; a few large veins crossed the growth; and the inguinal glands were not involved.

<sup>1</sup> Prager Vierteljahrschrift, vol. ii. 1871, p. 6.

<sup>2</sup> Billroth, Chirurgische Klinik., Zurich, 1860-67, p. 568.

<sup>3</sup> Langenbeck's Archiv, vol. xvii. p. 102.

<sup>4</sup> Virchow's Archiv, vol. xxviii. p. 237.

Two years previously, without assignable cause, she was seized with intense pain in the knee, which soon began to swell. It was then treated as synovitis, and a plaster-of-Paris splint, which was applied, intensified her suffering to such a degree that it had to be removed. In September, 1874, or eleven months after the trouble was first noticed, Professor Post tied the femoral artery, under the supposition that he was dealing with an aneurism of the lower end of the femur. The operation materially relieved the pain for some months. In April, 1875, the tumor was diagnosed to be cancerous, but she declined surgical interference. When seen by Dr. Burchard, it was pronounced to be an osteosarcoma, and amputation was advised.

After this date, the woman was lost sight of, until January 24, 1876, when she was found to be excessively emaciated, suffering greatly from dyspnoea, and in a dying condition. The total duration of the disease was two years and three months. A complete autopsy was not permitted.

On laying open the osteo-periosteal capsule, I found that the growth originated in the lower epiphysis of the femur, which was separated from the shaft by a dentated fracture. It was a medullary tumour, and the seat of large extravasation-cysts, and extensive calcareous deposits. The investing cartilages of the joint were sound.

Minute examinations, which were conducted with Dr. Shakespeare, of thin sections taken from the firmer, fibrous-looking, peripheral portions of the neoplasm, disclosed a connective tissue stroma, the trabeculae of which inclosed round, oval, and fusiform alveoli, which averaged  $\frac{1}{300}$  inch in length and  $\frac{1}{1000}$  inch in breadth, and were filled with lymphoid cells, containing large nuclei. Although the vessels were not injected, they were seen to have undergone sarcomatous changes.

It will thus be seen that the likeness of alveolar round-celled sarcoma to encephaloid or soft carcinoma is so great that a mistake is liable to occur to an inexperienced observer. Indeed, these tumours are regarded by Rindfleisch<sup>1</sup> as sarcomas undergoing carcinomatous degeneration, on which account he terms them carcinomatous sarcomas. The points of distinction, however, are, first, that the cells are intimately connected with the walls of the alveoli or the vessels which form the alveoli; secondly, that, by pencilling, an intercellular substance, like that met with in the lymphadenoid form of tumour, is disclosed, the fibres of which arise from the coarser trabeculae which separate the tissue into groups of cells, and, thirdly, that the cells are pretty uniform in shape and size, being round and oval, and of about the dimensions of a white blood corpuscle. In carcinoma, the cells are of an epithelial type, loosely heaped in the loculi, without the intervention of intercellular substance, and polymorphous, and vary greatly in size. In other words, in alveolar sarcoma the stroma and cells are intimately interwoven into a single tissue, whereas in carcinoma, the cells and stroma are easily separable into two distinct tissues.<sup>2</sup>

Like the other forms of central sarcoma, round-celled tumours are generally globular or ovoid, and of a smooth, even outline. When, however, they are very soft, or are the seat of extravasations of blood, or when they

<sup>1</sup> Op. cit. p. 136.

<sup>2</sup> Vide Waldeyer, Virchow's Archiv, Vol. Iv. p. 151.

have burst through their capsules, they are bosselated, and in this event the prognosis is bad. They are contained in an investing capsule, which is usually membranous or partly osseous, and completely bony in one-fourth of all instances. From the inner surface of the capsule bands are sometimes given off which intersect the mass and give it a lobed appearance.

On section, the cut surfaces are white, grayish-white, pinkish-yellow, or roseaceous gray, and pervaded by enlarged vessels, or marked by dark-red, or brown, or violaceous points, or dotted with minute ecchymoses. In some examples, the tissue looks precisely like a recent coagulum; in others, and this is not infrequent, the centre of the tumour is occupied by a single cyst filled with blood in various stages of transformation, or by numerous extravasation-cysts. In other specimens yellow areas denote fatty changes. Their consistence is usually soft and moderately elastic, but they are so friable that they are readily crushed by slight pressure. In some examples there is a disposition on the part of the material to tear in bundles; but, in general, their consistence, when they first come under observation, at which time they have undergone certain retrograde changes, is comparable to that of softened cerebral pulp.

The vascularity of round-celled sarcomas is varied. In the tumours which are composed of a tissue analogous to that of granulations, the blood supply is comparatively slight. In the lymphadenoid and alveolar forms, on the other hand, the tissue is pervaded by voluminous vessels, arterial, venous, and capillary. Hence it is by no means uncommon, when the arteries predominate, for these tumours to pulsate and simulate aneurism, as happened in the cases of Billroth,<sup>1</sup> Burchard,<sup>2</sup> Mercier,<sup>3</sup> and Lücke.<sup>4</sup> In other, or in the same, instances, extensive interstitial effusions of blood are met with, as occurred in those recorded by Bryant,<sup>5</sup> Poland,<sup>6</sup> Lücke,<sup>7</sup> Weil,<sup>8</sup> Burchard,<sup>9</sup> and Butler,<sup>10</sup> through which the neoplasm has the appearance of a recent clot, or is converted almost entirely into a large blood-cyst, the walls of which are composed of a thin layer of the original sarcomatous tissue, and, perhaps, lined by soft clots or layers of fibrine. From these accidental appearances have originated the names hæmatoma of bone, hæmatoid cancer,<sup>11</sup> and blood-cyst. In cases of this description minute examination discloses that the cause of the hemorrhage is to be found in the state of the minute vessels and the metamorphoses which the growth has undergone. In the majority of instances, fatty, myxomatous, or hyaline degeneration has taken place, and the adventitia of the vessels is

<sup>1</sup> Ante.<sup>2</sup> Ante.<sup>3</sup> Bull. Soc. Anat. de Paris, ser. 2, vol. ii. p. 241.<sup>4</sup> Virchow's Archiv, Vol. xxxv. p. 530.<sup>5</sup> Guy's Hosp. Rep., ser. 3, vol. xx. p. 358.<sup>6</sup> Ibid., vol. xvi. p. 469.<sup>7</sup> Ut supra.<sup>8</sup> Prager Vierteljahrschrift, Bd. iv. 1877, p. 14.<sup>9</sup> Ante.<sup>10</sup> Lancet, vol. ii., 1876, p. 607.<sup>11</sup> Paget, op. cit. p. 758.

ral health was much improved, the scapula was found to be involved in a hard tuberos tumour. After preliminary ligation of the subclavian artery, the entire scapula, along with an inch and a half of the acromial end of the clavicle, was extirpated, and the growth was discovered to be of the same nature, but devoid of cartilage or cysts. Death ensued a year and a half afterwards from deposits in the lungs.

All of the patients underwent operation, but in four the histories are too incomplete to be of any use in determining the degree of malignity of these formations. In five, of which I have just given abstracts, there were metastatic deposits, and in three of these there was local recurrence. Hence, periosteal spindle-celled sarcomas may be regarded as the most pernicious of all the sarcomas, as every case is characterized, at some time or other, by malignant features.

The total duration of life from the first appearance of the disease until its termination after operation, varied from three to forty-eight months, the average having been twenty months, or seventeen months less than the mean life of the central spindle-celled tumours.

Periosteal spindle-celled sarcomas usually form dense, hard, smooth tumours, which are, however, soft, or of varying degrees of consistence, and lobulated, when they have perforated their capsules. They are ushered in by pain in 85.7 per cent. of all cases, and by a tumour alone in 14.2 per cent. Suffering is never absent, and at times it is almost unbearable. The skin is variously altered in 22 per cent., and the subcutaneous veins are prominent in 33 per cent. of all cases, while sympathetic enlargement of the lymphatic glands occurs in only 11 per cent. Pulsation is never observed, and fracture from slight causes is found in 11 per cent. of all instances.

Finally, a firm, slowly growing, painful, and non-pulsating tumour, occurring at about the twenty-fourth year, and not attended by fracture, lymphatic involvement, or discoloration of the skin, but with possible enlargement of the subcutaneous veins, may be regarded as a periosteal spindle-celled sarcoma.

### 3. *Periosteal Osteoid Sarcoma.*

As a result of the remarkable disposition evinced by periosteal sarcomas to undergo calcareous infiltration or ossification of their intercellular substance, a variety has arisen which, even at the present day, is very imperfectly understood, and is generally spoken of as osteoid cancer. In his memoir on the subject, published in 1843, Müller,<sup>1</sup> while recognizing the existence of osteoid carcinoma, described under the name of "Osteoid Tumour," or "Ossifying Fungus," a particular kind of ossifying connective-tissue tumour, which differed histologically from carcinoma, although it gave rise to secondary deposits of a similar nature in the lymphatic glands and the internal organs. Two years subsequently, Lebert<sup>2</sup> curiously

<sup>1</sup> Müller's Archiv, 1843, p. 396.

<sup>2</sup> Physiologie Pathologique, vol. ii. p. 231.

crucial ligament may be seen a pedunculated lobulated growth, of the shape of a kidney and as large as half a hen's egg. In only one instance, that of Mr. Butlin,<sup>1</sup> were the glands enlarged; but as they subsided in great part after amputation, the inference is fair that they were merely the seat of irritative hyperplasia.

Metastatic deposits occurred in four of the five cases in which the histories are complete, while in one there was local return in the stump and the patient died with symptoms indicative of visceral contamination. In the case of Mr. Jackson,<sup>2</sup> the patient recovered from amputation, but died thirteen months afterwards from secondary growths of the brain. In that of Mr. Butlin,<sup>3</sup> which was an example of the hemorrhagic form of the affection, amputation of the thigh was practised for a tumour of the lower end of the femur of eight months' duration. At the expiration of five months, the limb was removed at the hip on account of recurrence in the stump, which was noticed one month previously, or four months after the first operation; but death ensued from presumed secondary disease of the viscera in less than a month. In the case of Allin,<sup>4</sup> in which disarticulation of the humerus was practised for a tumour of four months' standing, the disease returned in the stump in eight weeks, which fungated, and death occurred six months after the operation. Almost the entire scapula was involved in the recurrent growth, the lungs were pervaded by metastatic tumours, and the retroperitoneal lymphatic glands were extensively involved. In the instance recorded by Mr. Nunn,<sup>5</sup> in which amputation was done for a growth of the lower third of the femur, which had existed only three months, death ensued from pyæmia on the sixth day, when "enlarged, soft, and dark-coloured glands were found in the groin and in the pelvic and lumbar regions."

The fifth and last example of the general dissemination of the disease, which occurred in the practice of Langenbeck,<sup>6</sup> is so remarkable that it deserves a somewhat more extended notice.

CASE XV. A man, 23 years of age, in 1855, suffered from rheumatoid pains in the right arm, which prevented him from working. In 1857 he fell and broke the humerus, but the fracture united in four weeks. Six months subsequently, a tumour began to grow rapidly at the seat of the injury, and, in November, 1859, it reached from the neck of the humerus to within three inches of the elbow, and measured three feet in its greatest circumference. The skin was merely greatly stretched, and the tumour was hard at some points and fluctuating at others. The man was very anæmic and had no sleep from pain. After disarticulation at the shoulder, two years and a half after the fracture, the mass was found to be a fibrous sarcoma, containing scattered nodules of cartilage and many cysts, one of which contained a gallon of mucoid fluid. Recovery ensued, but local recurrence soon set in, and on his return in April, 1860, or five months subsequently, when his gene-

<sup>1</sup> Ante.

<sup>2</sup> Ante, and Trans. Path. Soc., Lond., vol. xix. p. 33.

<sup>3</sup> Ante.

<sup>4</sup> The Medical Record, Feb. 9, 1878, p. 116.

<sup>5</sup> Ante.

<sup>6</sup> Langenbeck's Archiv, vol. iii. p. 340, and case 104, p. 306, and Deutsche Klinik, 1860, p. 217.

Five cases occurred in females, and four in the opposite sex; and three, or 33 per cent. were due to traumatism.

The age at which they were first noticed was, respectively, 15, 16, 19, 21, 21, 23, 28, 34, and 41, the average being 24.2, or 12 years earlier than in the central spindle-celled growths.

Their growth is, as a rule, uninterrupted and comparatively slow. In the case of Mr. Nunn,<sup>1</sup> the tumour remained stationary for one month, and at the date of amputation, or three months after its detection, it had increased at the rate of half an inch a week. In the remarkable case of Mr. Jackson,<sup>2</sup> to which reference will again be made, not only did the further progress of the tumour cease for a number of years, but it appears as if it had developed from a fibroma. Thus, at the age of nine years, a girl detected a small, flat, painless growth, one inch long, on the inner side of the knee, which grew somewhat up to her thirteenth year, and afterwards more slowly, until, at the age of twenty-four, it was of the size of a large walnut. From this date up to her forty-first year, it did not increase a particle, when the woman fell on both knees, in consequence of which it took on renewed activity, and a large medullary tumour resulted.

Local infection of the surrounding tissues and the lymphatic glands is comparatively uncommon. The skin was invaded in one instance; the

Fig. 7.



muscles in two; the involved bone was superficially eroded in one, and fractured in one. In none of the nine cases did the disease extend to the medullary canal, and in none was the corresponding joint involved. In a specimen of large spindle-celled sarcoma of the lower end of the femur, however, which is from the cabinet of Professor Gross, but which is devoid of history, the medullary canal, to an extent corresponding to the external tumour, is infiltrated with a pearly tissue, which terminates, as is shown in Fig. 7, above the upper limit of the tumour in a conical mass, which is made up of fragile radiating fibres. At the junction of the shaft with the epiphysis the new tissue has undergone softening, and projecting into the joint from the intercondyloid notch, along the side of the external

<sup>1</sup> Trans. Path. Soc. Lond., vol. xvi. p. 339.

<sup>2</sup> Ante.

these statements as the basis upon which to grade the malignity of these growths, it will be perceived that they are destructive to life in 66.66 per cent. of all instances.

Periosteal round-celled sarcomas make themselves known by pain in 55 per cent. of all instances, and by the appearance of a tumour alone in 44 per cent. In 66 per cent. pain is present throughout the entire course of the disease, while it is absent in 33 per cent. The skin is adherent, discolored, or ulcerated in 51 per cent.; the subcutaneous veins are enlarged in 41 per cent.; the temperature is elevated in 33 per cent.; the lymphatic glands are tumefied in 38.46 per cent.; and spontaneous fracture occurs in 7 per cent. of all cases. Pulsation is never present.

Finally, a rapidly-increasing, painful, lobulated, soft, elastic, non-pulsatile, pyriform or fusiform tumour, especially if seated on the shaft of a long bone, occurring at about the twenty-third year, and unaccompanied by fracture, but marked by discoloration of the skin, enlargement of the subcutaneous veins, involvement of the lymphatic glands, and elevation of temperature, may be safely ranked among the periosteal round-celled sarcomas.

## 2. *Spindle-celled Sarcoma.*

Peripheral sarcomas, composed of fusiform cells, differ clinically from those made up of similar elements of central origin, by their greater frequency in males, by their occurrence at a far earlier age, by their non-pulsation, and by their indisposition to invade the joints. The subcutaneous veins are not so often enlarged; the skin is less liable to be altered; fracture of the involved bone is incomparably less common, while general dissemination is constant, since all the subjects die, sooner or later, of secondary visceral contamination, whether they are subjected to operation or not.

Inflammation of these tumours is so rarely met with that superficial ulceration of the skin occurred in only one instance.<sup>1</sup> They are, however, more disposed to cystic degeneration than are the central growths, through which they may assume a gigantic size, as happened in the case of Langenbeck, which I will quote presently. Mucous cysts are present in 33 per cent. of all instances, while a large cyst containing blood was found in one case,<sup>2</sup> or in 11 per cent. of the entire number.

Periosteal spindle-celled sarcomas, unlike the peripheral round-celled tumours, surround the epiphyses more frequently than the shafts of the long bones. Their seat in nine cases was around the

Femur, lower epiphysis,	in 3 cases,	shaft,	in 2 cases.
Humerus,		" " 2 "	
Tibia, upper	"	in 1 case.	
Ulna, lower	"	" 1 "	

<sup>1</sup> Jackson, Trans. Path. Soc. Lond., vol. xviii. p. 215.

<sup>2</sup> Butlin, Ibid. vol. xxv. p. 210.

into the joint without opening it. In neither case was the cartilage involved. Enlargement of the associated lymphatic glands was observed in 5 cases, or 38.46 per cent. of the entire number. In two of these, the state of the glands was not noticed. In two,<sup>1</sup> it is very probable that they were merely swollen from irritation, as the patients were alive, respectively, fourteen and forty months after amputation of the thigh; while in one,<sup>2</sup> which was an example of alveolar sarcoma, the femoral glands showed tumour elements.

General dissemination of the disease, or the occurrence of secondary growths, was met with once, and it was presumed to have taken place in three of the eight cases in which the histories are finished. Unfortunately, in none of these was there a post-mortem inspection, but there can be no doubt that the lungs were affected in all. In the case of Labbé<sup>3</sup> there was also recurrence in the stump; while in one, recorded by Barwell,<sup>4</sup> in which excision of the upper portion of the humerus, including its head, was practised for a growth of eleven weeks' standing, in a lad, aged ten years, the disease returned about the acromion process in three weeks.

All of the cases of periosteal round-celled sarcoma were subjected to operation, save one, which ran a natural course; but its history is too incomplete to be of any service. Of the remaining twelve, ten underwent amputation and two excision, the latter being confined to the shoulder-joint, and in both there was recurrence in the stump as stated above. Of the twelve cases, in four the histories are not perfect. Hence, in eight cases, the duration of life, from the first observation of the disease to its termination, varied from two months and a half to five years and one-third, the average having been eighteen months, so that there is no difference in the duration of life of patients afflicted with round-celled tumours, be they of peripheral or central origin. Of the eight cases, in two<sup>5</sup> death was directly due to surgical measures; one recovered, but died from metastatic deposits at the expiration of thirty-two months;<sup>6</sup> three<sup>7</sup> recovered, but died subsequently from supposed systemic infection, respectively, at seven, eight, and nine months; one<sup>8</sup> was alive with local recurrence at the end of three weeks; and one<sup>9</sup> remained well for forty months. Hence, six patients recovered from surgical interference, but of these only one remained well without local recurrence,<sup>10</sup> while one died of generalization, and three subsequently succumbed from supposed metastatic deposits. Taking

<sup>1</sup> Cases of Poinot and Bryant.

<sup>2</sup> Hutchinson, Trans. Path. Soc., Lond., vol. xxvii. p. 265.

<sup>3</sup> Bull. et Mém. de la Soc. de Chir., vol. iii., 1877, p. 211.

<sup>4</sup> Trans. Path. Soc., Lond., vol. xxvi. p. 168.

<sup>5</sup> Case XI. p. 358, and Case of Hutchinson.

<sup>6</sup> Reference mislaid.

<sup>7</sup> Cases XII. and XIII. p. 359, and Case of Labbé.

<sup>8</sup> Case of Bryant.

<sup>9</sup> Case of Barwell.

<sup>10</sup> Case of Bryant.



assume it to have been an example of round-celled tumour. I have, however, not included it in the study of the general pathology of the disease.

As the microscopic appearances, consistence, and degenerations of the periosteal round-celled sarcomas do not differ from those of the central round-celled tumours, they need not detain us. Spontaneous inflammation occurred in only two instances: In that of Poinso<sup>1</sup> the skin gave way, and a fungus protruded; while in my own case, as I have just observed, the superficially ulcerated integument opened, and profuse bleeding ensued.

Periosteal round-celled sarcomas surround the shafts much more frequently than the epiphyses of the long bones. Their seat in 13 cases was around the

Humerus, shaft,	in 4 cases.
Femur,        “	in 2 cases, lower epiphysis in 2 cases.
Tibia,         “	in 1 case, upper       “       in 2       “
Ulna,         “	in 1       “
Tibia,         “	in 1       “

Ten cases occurred in males, and three in females. In seven, or 54 per cent., the tumour was traceable to traumatism.

The age at which they were first noticed was, in eleven instances, respectively, 7, 10, 14, 14, 19, 25, 27, 32, 32, 36, and 40 years, the average being 23.2 years, or five years earlier than in the central round-celled tumours.

Their growth is usually continuous and rapid. Thus, they may attain the size of a double fist in twelve weeks, or a circumference of thirteen inches more than the sound limb in four months. In the case recorded by Poinso<sup>1</sup>, on the other hand, a small growth of the shaft of the tibia had existed for several years, and had increased very slowly, when it took on renewed action, and acquired the volume of two fists in six months.

Local infection of the adjacent structures is quite common. The soft tissues were invaded in 50 per cent. of all cases. In two instances the subjacent bone was eroded; in two it was not only eroded, but the medullary canal was the seat of tumour tissue; while in one case,<sup>2</sup> in which the tumour corresponded to the lower half of the tibia, that bone was destroyed to the extent of two inches, an encysted nodule was discovered in its tuberosity, and the superficial portions of the fibula were ulcerated. Hence, the bone itself is implicated in the disease in 38 per cent. of all instances.

In a remarkable case, recorded by Steudener,<sup>3</sup> the knee-joint was perforated by a growth which sprang from the anterior surface of the head of the tibia, and gave rise to diffuse sarcomatous degeneration of the synovial membrane and the subcrural bursa. In an instance of round-celled tumour of the inner condyle of the femur, reported by Bryant,<sup>4</sup> the growth bulged

<sup>1</sup> Bull. et Mém. de la Soc. de Chir., vol. iii., 1877, p. 208.

<sup>2</sup> Ibid.

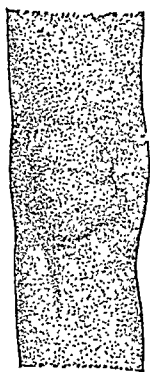
<sup>3</sup> Virchow's Archiv, vol. xlv. p. 500.

<sup>4</sup> Guy's Hosp. Reports, ser. 3, vol., xxii. p. 318.

veins were prominent over the anterior or palmar face of the mass, which was developed principally at the expense of the ulnar aspect of the forearm, being very prominent in front and behind, while the radial side preserved its natural outline. The tumour was fusiform in shape, but more bellied on its ulnar side; its consistence was elastic, and, at points, apparently fluctuating, and its surface was somewhat bosselated. There was neither pain nor tenderness, but the temperature was elevated. The axillary glands were markedly enlarged. After amputation the tumour measured six inches in length and four inches and a half in width. It had developed at the site of the fracture, which was at the middle of the ulna, and was of periosteal origin, although that membrane was lost in the middle of the mass. The upper and lower epiphyses of the bone were not involved. The brain-like tissue, of which the tumour was composed, was soft and easily crushed, undergoing limited cystic transformation, and pervaded by injected vessels and hemorrhagic deposits. Unfortunately the history of the case is incomplete, as Dr. Collins informs me that the boy died of lung symptoms eight months after he removed the limb, and was buried before he was aware of his decease.

CASE XIV. A woman, four months pregnant, and aged thirty-three years, came to my clinic at the Jefferson Medical College Hospital on the 3d of August, 1878, with a soft, fluctuating tumour of the lower extremity of the left femur, which was most prominent internally and posteriorly, there being little enlargement on the outside of the thigh. Its summit was the seat of two bosses, the larger of which was superficially ulcerated to the extent of a twenty-five cent piece. In this situation the skin was thin, red, adherent, and pervaded by small vessels. Elsewhere it was mobile, stretched, and shining. A few subcutaneous veins were enlarged, and there was a gland in the situation of the saphenous opening of the size of a lemon. The temperature, taken with Seguin's surface thermometer, indicated  $98^{\circ}$ , while that of the sound limb was only  $94^{\circ}$ . The tumour, which is delineated in Fig. 6, extended six inches and a half above the patella,

Fig. 6.



and measured ten inches more in circumference than the sound limb. The patient stated that she was seized, without assignable cause, two years previously with spasmodic pain in the situation of the inner condyle, which persisted and increased in frequency, and was followed, eight months subsequently, by the appearance of a small lump, which grew slowly but continuously; until three months ago, when it increased rapidly. At that time she first noticed the glandular enlargement, and one

month afterwards the skin broke. The leg was cedematous; the tumour was painful and somewhat tender, and she had lost flesh and appetite. As she declined surgical aid, she returned home unrelieved, and I was subsequently informed that the mass had given way ten days subsequently at the point of ulceration, and had been the seat of fatal hemorrhage. Although there was no minute examination, from a careful study of similar cases I

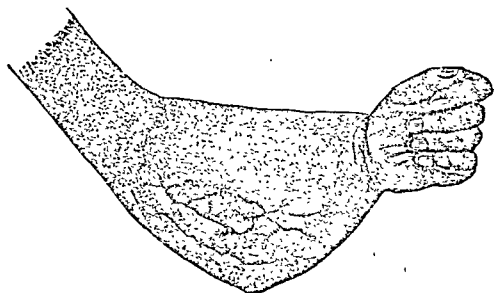
inches of its lower end, and measured seventeen inches in its greatest circumference. On laying open the capsule the great mass of the neoplasm was found to consist partly of a soft pinkish-white or brain-like tissue, dotted here and there with small vascular points, and partly of hæmatoid substance, which closely resembled an organizing thrombus. Indeed, the likeness to the hæmatoid variety of medullary sarcoma was most striking. Scattered throughout the tissue, but not in great numbers, were cysts with gelatinous contents. The humerus was fractured at two points, which corresponded with the junction of the middle with the upper and lower thirds, and its surface was deeply eroded, the loose fragment especially presenting a worm-eaten appearance. The overlying muscles were adherent to the capsule, and had a pale and gelatinous look.

Very numerous sections from different portions of the growth disclosed that it was composed of lymphadenoid tissue, which differed in no wise from that delineated in Fig. 2. The muscles adherent to the periosteal capsule had become infiltrated by the elements of the tumour. Their fibres were very friable, and had undergone incipient fatty transformation, as was indicated by molecular infiltration and the absence of transverse striation. The interfascicular connective tissue was pervaded by granular lymphoid cells, the nuclei of which became apparent on the addition of acetic acid; but I failed to discover any participation of the nuclei of the muscles in the morbid action. A few giant cells were found in the tissue which filled the cavities of the eroded bone.

CASE XII. In a second example, which was also under the charge of Professor Gross, the structure was precisely similar. The soft, elastic, pyriform, and slightly lobulated tumour, which was of ten months' standing, and traceable to a blow, surrounded the head of the tibia of a lad fourteen years of age. The skin was thin and shiny, but mobile; the subcutaneous veins were greatly enlarged, and the temperature much elevated. The material of which it was composed had the consistence and appearance of the brain of a newly-born child; but was soft at points, and the seat of extensive extravasations of blood. The boy died, nine months after amputation through the lower third of the thigh, with chest symptoms; and, although a post-mortem examination could not be obtained, it was presumed that the lungs were the seat of metastatic deposits.

CASE XIII. In a third instance, which I saw with Dr. Collins, surgeon to the German Hospital of this city, the tumour was composed of a mass of small, round lymphoid cells, with scarcely any visible intercellular substance, which was pervaded by a large meshed, lozenge-shaped network of capillaries with very thin walls. It was met with in a boy nine years of age, at the site of a fractured ulna, the accident having occurred one year previously. It extended, as may be seen in Fig. 5, from the wrist to the elbow, and measured eight inches and a half more in its greatest circumference than did the corresponding point of the opposite arm. The skin was natural except at the most dependent part of the growth, where it was thin and injected, particularly around a nipple-shaped eminence, where a puncture had been made eight weeks previously. The subcutaneous

Fig. 5.



terially from those of a similar structure which arise in the medulla. Of the thirteen cases that I have examined, seven were of the ordinary granulation type, four were alveolar, and two were of the lymphadenoid variety. While they grow as rapidly, and kill as quickly as do the central sarcomas, they occur at an earlier age, are most common in males, evince greater disposition to local infection and metastatic deposits, contaminate the associated lymphatic glands, and produce changes in the skin more frequently, and elevate the local temperature in a much larger proportion of the cases. Unlike the central round-celled tumours, they very rarely occasion fracture of the affected bone, never pulsate, nor are they the seat of such extensive extravasations of blood.

Excellent illustrations of the structure and of the great rapidity of the growth of these neoplasms are afforded by the following cases:—

CASE XI. A youth, nineteen years of age, on the 7th of July, 1872, accidentally struck his left arm above the elbow, but the injury, which was followed by slight ecchymosis, was productive of so little inconvenience that he continued his work about the farm. Five weeks and a half subsequently he first noticed a tumour, about as large as a pullet's egg, at the site of the blow. This rapidly enlarged, and, on the 9th of November of the same year, or at the expiration of four months, when he was admitted into the hospital of the Jefferson Medical College, it measured, at a point

Fig. 4.



seven inches above the inner condyle, twenty inches in circumference, or thirteen inches more than the opposite limb at a corresponding point, while its length was nine inches. Its growth was painless throughout; the entire limb was very œdematous; the temperature was elevated; the subcutaneous veins were immensely enlarged; the skin was discolored and adherent; and its consistence was soft and apparently fluctuating. One morning, about six weeks before admission, he noticed that the humerus had given way during the previous night. There was no glandular involvement; the patient had a good appetite, and slept well, but the pulse was irritable and weak; the face was sallow and anæmic, and he was much emaciated. The mass had been punctured one week previously under the supposition that it was an abscess, but blood only followed the withdrawal of the knife. Amputation at the shoulder-joint by cutaneous flaps was performed, after a few days of preliminary treatment, by Professor Gross, but the patient expired from exhaustion five hours after the operation.

After the soft parts were removed, the tumour was found to be lobulated and to be contained in a perfect periosteal capsule. As may be seen from Fig. 4, it grew principally from the outer and posterior surfaces of the bone the projection from the inner surface being comparatively slight. It surrounded the entire humerus with the exception of two inches of its upper extremity, and three

and allow the disease to invade the adjacent tissues. The bone itself upon or around which the growth is seated may be entirely normal, or be partially absorbed, and present numerous cavities through local infection of its cortex. Now and then it is rendered so brittle that it fractures from very slight causes; in other cases, the medullary canal and the spongy substance of the epiphysis are the seat of new deposits from the extension of the disease along the Haversian system.

Periosteal sarcomas, so far as my investigations go, never form myeloid tumours, although a few giant cells may be detected at the points where the bone has been destroyed. In their histological construction, they are either made up of a spindle-celled or a round-celled tissue, which evince a remarkable tendency to calcification or ossification of their intercellular substance, which is easily explained by their point of origin. In many instances the deposition of the early salts and ossification proceed to such an extent, that, when the softer portions have been removed by maceration, a bony skeleton or framework is left, which might be mistaken for spongy exostoses or osteophytes.

Periosteal sarcomas, which have not undergone these transformations, are comparatively rare. Thus of 67 specimens or histories that I have examined, 9, or 13 per cent., were composed of more or less pure spindle-celled tissue, 13, or 19 per cent., of round-celled tissue, while not less than 45, or 67 per cent., were instances of ossifying and calcifying tumours.

In a general way, periosteal sarcomas may be distinguished from the central sarcomas, by their relative infrequency, by their occurrence earlier in life, the average age at which they appear being  $22\frac{1}{2}$  years, by their marked malignity, which is greater by 43.5 per cent. than in the myelogenic tumours, by the more frequent implication of the lymphatic glands, by the excessive suffering which they awaken, and by their disposition to calcareous and ossific transformations, which is greater, by 47 per cent., than in the central growths. They are not contained in bony capsules, are not so liable to extensive effusions of blood, and they evince little tendency to invasion of the joints, to pulsation, and to fracture from slight causes. Thus, while extension into the articulations, pulsation, and fracture occur in the central sarcomas in the proportion respectively of 18 per cent., 20 per cent., and 20 per cent., these features are only met with in 7 per cent., 1.8 per cent. and 5 per cent. of the peripheral tumours.

In accordance with the plan that I have followed in the study of the central sarcomas, I shall analyze those of periosteal origin, dividing them into the round-celled and spindle-celled, and making a separate group of the osteoid tumours, as a good deal of confusion still exists as to their true nature.

### 1. *Round-celled Sarcoma.*

In their histological construction, degenerations and combinations, and appearances on section, periosteal round-celled sarcomas do not differ ma-

CENTRAL CHONDROMA.<sup>1</sup>

1. Forms 14 per cent. of all cartilaginous tumours.
2. Appears between the seventeenth and fifty-ninth years, the average being the thirty-third year.
3. Eighty per cent. of all cases occur in males.
4. Grows comparatively slowly; but may acquire a huge bulk.
5. Usually begins insidiously, but pain is present throughout in 30 per cent. of all cases.
6. The subcutaneous veins are enlarged in 60 per cent. of all cases.
7. The skin is variously altered in 20 per cent. of all cases.
8. The lymphatic glands are enlarged in 10 per cent. of all cases.
9. Spontaneous fracture, or fracture from slight causes, is met with in 20 per cent. of all cases.
10. Metastatic deposits, or general dissemination of the disease, do not occur.
11. Never pulsates.
12. Does not invade the joints.

CENTRAL SARCOMA.<sup>2</sup>

1. Forms 59 per cent. of all sarcomas.
2. Appears between the ninth and sixty-eighth years, the average being the twenty-ninth year.
3. Fifty-six per cent. of all cases occur in males.
4. Increases comparatively rapidly, and never attains so large a size.
5. Generally ushered in by pain, and suffering is present throughout in 60 per cent. of all cases.
6. The veins are enlarged in only 30 per cent. of all cases.
7. The skin is altered in 37 per cent. of all cases.
8. The lymphatic glands are enlarged in 14 per cent. of all cases.
9. That accident occurs also in 20 per cent. of all cases.
10. Secondary deposits are met with in 25 per cent. of all cases.
11. Pulsation is observed in 20 per cent. of all cases.
12. The joints are involved in 18 per cent. of all cases.

As the distinction between aneurism, white swelling, and sarcoma of the bones was dwelt upon in my first paper, it need not be referred to again.

II. *Periosteal Sarcomas.*

The peripheral, periosteal, or periosteal sarcomas include those which originate in the soft osteogenic layer of the periosteum, in contradistinction to the tumours which are attached to the outer fibrous layer of that membrane, which should rather be considered as parosteal growths, or sarcomas developed in the tissues surrounding the bone and affecting the periosteum secondarily. In the true peripheral sarcomas, the tumour is seated between the bone and periosteum, the latter of which is constantly regenerating itself to form a limiting capsule for it, which persists unchanged in the firm sarcomas, but is liable to be transformed into tumour elements in the soft sarcomas, through which it may finally be destroyed,

<sup>1</sup> Based upon an examination of ten cases.

<sup>2</sup> Based upon an examination of seventy-eight cases.

of those surviving surgical interference between the giant and spindle-celled sarcomas, is due to the fact that in one of the latter life was prolonged for seven years, and the cases were much less numerous.

It will also be seen, and this also is an important aid in the differential diagnosis, that a central sarcoma occupying the shaft of a long bone is far more likely to be a round-celled or a spindle-celled, than a giant-celled growth. Although pulsation is more frequent by 13 per cent. in round-celled tumours than in those composed of multinucleated elements, it is remarkable that in the former the shafts of the bones were affected in three of the four cases in which that sign was noticed, whereas the epiphyses alone were involved in the latter. In the two instances of spindle-celled sarcoma the pulsating tumour was seated in the shaft in one and in the articular extremity in the other. Hence if a pulsating central sarcoma is observed in the diaphysis of a long bone, the chances are three to one that it is composed of round cells, and that in no instance is it a myeloid tumour. If, on the other hand, the epiphysis of a long bone is occupied by a pulsating growth, the chances are ten to one that it belongs to the giant-celled variety.

Of the remaining central neoplasms of the tubular bones the only one that is liable to occasion errors in diagnosis is enchondroma. When compared with the sarcomas it is of far less frequent occurrence, as it forms only 14 per cent. of all cartilaginous tumours, while 59 per cent. of all sarcomas originate in the medulla. It is less painful, of slower growth, of firmer consistence, and has a nodulated or bosselated surface, which is rarely witnessed in sarcoma unless the capsule is perforated, or the morbid material is the seat of cystic degeneration or extensive hemorrhages, when, in addition, the tumour is soft. Enchondroma, moreover, is more common in males; it never occurs so early or so late in life as the sarcomas; and it appears, on an average, four years sooner than the latter. It does not pulsate, invade the joints, nor does it fungate, although in 20 per cent. of all instances the overlying integuments ulcerate and the degenerated fluid contents escape, to the amount even of thirty-two quarts, as in an example recorded by Nélaton.<sup>1</sup> Enchondromas are very liable to undergo mucoid softening and cystic degeneration, those changes having occurred in 60 per cent. of all instances, in consequence of which they not only attain a huge volume,<sup>2</sup> far greater, indeed, than do the sarcomas, but are also attended by frequent enlargement of the subcutaneous veins. Finally the central chondromas do not give rise to metastatic deposits.

For convenience of reference the characteristics of these affections are given in the subjoined table.

<sup>1</sup> Gazette des Hôpitaux, No. 13, 1855, p. 50.

<sup>2</sup> In the cases of Nélaton and Crampton, for example, the thigh measured, in the first, nearly six feet, and, in the second, six feet and a quarter in circumference.

In conclusion, an immovable, bulky, rapidly growing, painful, soft, pulsating tumour, especially if seated in the shaft of a long bone, occurring at about the 28th year, and attended with fracture, and, possibly, the protrusion of a fungous mass, and enlargement of the subcutaneous veins, but without discoloration of the skin or involvement of the lymphatic glands, may be said to be a central round-celled sarcoma.

The treatment is limited to early amputation, practised as close to the trunk as may be consistent with the safety of the patient. If the tumour involves an epiphysis, the limb should not be removed through the corresponding articulation, as it is liable to be invaded by the morbid growth.

*The Differential Diagnosis of Central Sarcomas.*—Myelogenic sarcomas, especially when they increase rapidly, are liable to be confounded with each other. Hence, as an aid to their discrimination, I have set forth their affinities and contrasts in the following table:—

	Giant-celled.	Spindle-celled.	Round-celled.
Frequency of occurrence . . . .	71.42 p. c.	16.32 p. c.	12.24 p. c.
Appear before the 30th year . . . .	66.66 “	37.5 “	58.33 “
Seated in the shaft of the long bones . . . .	5.71 “	27.27 “	33.33 “
Ushered in by pain . . . .	50 “	60 “	75 “
“ “ swelling . . . .	19 “	30 “	25 “
“ “ “ and pain . . . .	31 “	10 “	0 “
Pain throughout the disease . . . .	40 “	100 “	91 “
Skin variously altered . . . .	33 “	40 “	41 “
Subcutaneous veins enlarged . . . .	27 “	50 “	41 “
Infection of adjacent tissues . . . .	12 “	18 “	66 “
Lymphatic glands tumefied or involved . . . .	16 “	0 “	25 “
Metastatic deposits . . . .	22.72 “	23.07 “	33.33 “
Local recurrence . . . .	8 “	20 “	25 “
Pulsation . . . .	20 “	12.5 “	33.33 “
Joints invaded . . . .	14 “	25 “	25 “
Fracture, spontaneous, or from slight causes . . . .	4 “	44 “	50 “
Duration of life without operation . . . .	46 mos.	42 mos.	23 mos.
“ “ with “ . . . .	40.9 “	37.2 “	17.6 “
“ “ “ “ and remain- ing well } . . . .	54.8 “	64 “	24 “

An inspection of the foregoing clinical features shows that all the varieties of central sarcoma are malignant, and that the degree of malignity is, commencing with the lowest, in the scale, in the order named. It is curious, however, to observe that the myeloid growths occur at an earlier age, and are marked by sympathetic lymphatic involvement nearly two-thirds as frequently as the round-celled, which are the most pernicious. It is also notable that in the spindle-celled tumours, the lymphatic glands are never enlarged, and, as this statement is almost true of the same variety as met with growing from the periosteum, it forms an important point in the diagnosis. The apparent discrepancy in the duration of life



quarter, the average having been 17.6 months. Of the 9 cases, in 5<sup>1</sup> death was directly due to surgical measures; one<sup>2</sup> recovered from operation, but died, eleven months subsequently, from secondary growths in the brain and skull; and three remained well, respectively, six weeks,<sup>3</sup> four months,<sup>4</sup> and four and a half years<sup>5</sup> after amputation.

The above facts indicate that round-celled sarcomas run a more rapid course than the other central tumours, the total duration of life after operation in the former being 17.6 months, against 40.9 months for myeloid sarcoma, and 37.2 months for spindle-celled sarcoma.

Round-celled sarcomas are ushered in by pain in 75 per cent. of all cases, and by the appearance of a tumour alone in 25 per cent., but in two-thirds of the latter suffering declares itself later. In one instance only was pain altogether absent. In the majority of cases it is continuous and severe, and increased by motion. The skin is variously altered in 41 per cent. of all cases, being merely stretched, but movable, in the great majority, and rarely discolored. The subcutaneous veins are enlarged in the same ratio, but only to a marked degree in about one-half of the cases. Spontaneous fracture occurs in 50 per cent. of all instances. In three an accident of this nature, preceded by pain in the part, and followed by the appearance of a tumour, which continued to increase, led Mercier, Bryant, and Heine, to diagnose malignant disease.

The tumour itself is usually smooth, spherical, or ovoid, and soft and moderately elastic in consistence, although it may be the seat of obscure and deep fluctuation. In rare cases its consistence is firm. On exploratory puncture, the instrument moves about freely, and blood escapes at the opening. The temperature is noted to have been elevated in one instance.<sup>6</sup> In four cases, or 33.33 per cent. of all cases, pulsation was present. In two of these the disease was thought to be aneurism, and in one the femoral artery was actually ligated. It is interesting to note that in three of these instances the shaft of the long bones was the seat of the tumour.

Pulsation occurs much more frequently in round-celled than in giant-celled sarcoma, and nearly three times as often as in spindle-celled sarcoma. In giant-celled tumours, however, pulsation was observed in those cases only in which the articular extremities of the long bones were affected; while, in round-celled tumours, that sign was met with three times when the shaft was affected, and only once when the epiphysis was the seat of the disease. Hence pulsation, when taken in connection with other symptoms, is a valuable point in the differentiation of these two forms of sarcoma.

<sup>1</sup> Cases of Nélaton, *op. cit.* p. 325; Teinturier, Bryant, Butler, and Billroth (*Chir. Klinik*, p. 568).

<sup>2</sup> Billroth, *ante.*

<sup>3</sup> Weil, *ante.*

<sup>4</sup> Bryant, *ante.*

<sup>5</sup> Lücke, *ante.*

<sup>6</sup> For elevation of temperature in sarcomas consult a paper by Professor Estlander, *Trans. International Med. Congress of Philada.*, 1876, p. 658.

the iliacus muscle were infiltrated with small deposits, and a nodule was also detected in the internal obturator muscle.

CASE IX.<sup>1</sup>—A woman, aged 34 years, died, without operation, under the care of Mr. Poland, with a fungating hemorrhagic sarcoma, of three years and two months' standing, which was pretty uniformly firm, hard, and inelastic, and had a circumference of thirty-four inches. The tumour, which consisted mainly of blood in various stages of transformation, occupied the upper half of the femur, and had partially invaded the round ligament, the acetabulum, and the iliac bone in the region of the anterior inferior spine. The inguinal glands were free from disease; the femoral vein contained polypoid growths of sarcomatous tissue; several soft masses projected from the surface of the lungs, but were rooted in the pulmonary tissue; and there were also several small nodules present beneath the pleura.

CASE X.—Billroth<sup>2</sup> disarticulated the arm of a girl, 9 years of age, on account of an alveolar sarcoma of the humerus. The patient had fully recovered from the operation, which was done on the 24th of June, 1865, in four weeks; but at the expiration of one month, secondary growths appeared upon the parietal bone, the occipital bone, and upon each mastoid process. At the time of death, May 20, 1866, shortly before which the sternum also became affected, the first tumour was as large as the fist, and the others were somewhat smaller. They were all at first firm, but latterly they were soft and fluctuating. There was no return in the stump, and there were no signs of lung complications. In addition to the tumours of the osseous system, a soft, dark-brown sarcoma of the size of a large apple was found in the brain. The entire duration of the disease was twenty-two months.

It will be observed that the lungs alone were the seat of metastatic deposits in two cases; that the pleura, liver, and kidneys were affected, but that the lungs escaped, in one; and that the osseous system and brain were involved in the fourth case. In no instance were the intervening lymphatic glands the seat of secondary deposits; while in one example a large vein was filled with the material of the tumour. These facts, taken in connection with those of a similar nature which occurred in the giant- and spindle-celled growths, show conclusively that constitutional contamination takes place through the bloodvessels and not through the lymphatics.

Of 12 cases of round-celled sarcoma, 3 ran their course without amputation. One of these, that of Mercier,<sup>3</sup> died of coma, about six months after the appearance of the first symptoms; one, that of Poland,<sup>4</sup> died of exhaustion and metastatic deposits at the expiration of thirty-eight months; while, in the case of Burchard,<sup>5</sup> the fatal termination ensued in twenty-seven months from supposed secondary deposits in the lungs. Hence the average duration of life is 23.2 months, which is much shorter than is witnessed in the other varieties of central sarcoma, since in myeloid tumours the mean prolongation of life, when the disease pursues a natural course, is 46 months, and 42 months in spindle-celled sarcoma.

In the remaining 9 cases, 8 of which were subjected to amputation, and 1 to excision, the duration of life, from the first observation of the disease to its termination, varied from two months and a half to five years and a

<sup>1</sup> Guy's Hosp. Rep., ser. 3, vol. xvi. p. 469.

<sup>2</sup> Chirurgische Klinik, Zurich, 1860-67, p. 453.

<sup>3</sup> Ante.

<sup>4</sup> Ante.

<sup>5</sup> Ante.

in the growth, is not uncommon, that accident having occurred in the cases recorded by Mercier, Bryant, Poland, Lücke, Weil, and Butler.

The locally infectious nature of these tumours declared itself by extensive infiltration of the medulla of the bones in which they originated, in two instances;<sup>1</sup> and by invasion of the surrounding muscles in four cases.<sup>2</sup> In one case<sup>3</sup> the tumor was being prolonged into the corresponding joint, but the cartilage was intact. In those recorded by Bryant and Poland, in both of which the upper extremity of the femur was the seat of the disease, the cartilages of incrustation were undergoing sarcomatous degeneration. In the case of Mr. Bryant, the disease had extended to the floor of the acetabulum through the round ligament; while in that of Mr. Poland, the ligament was sarcomatous only at its root, but the acetabulum and the anterior inferior spine of the ilium were invaded by the morbid tissue. The extension of sarcomatous elements by the ligaments is a point of extreme interest, as it has a direct bearing upon the question of amputating through a joint or at a point higher up. The same occurrence, it will be remembered, was witnessed in Mr. Butlin's osteoid myeloid sarcoma of the upper end of the tibia, in which the disease passed up to the femur through the crucial ligaments.

Enlargement of the neighbouring lymphatic glands was noticed in only three instances. In that of Teinturier, the inguinal glands were normal, and it was only upon dissection that those of the ham were found to be "degenerated." In the case of Bryant, the structure was that of an ordinary lymphatic gland in a state of irritation. In the third case there is no report of the condition of the glands.

Infection of distant organs, or generalization, occurs more frequently in round-celled than in any other central tumour of the long bones. It was met with in 33.33 per cent., or in four of the twelve cases, which I have collected, and of which I append brief abstracts.

CASE VII.<sup>4</sup>—A man, aged 24 years, had suffered, for nine months, from a partly hard and partly fluctuating tumour of the head of the tibia, which had a circumference of eight inches more than the sound limb. After amputation, which proved fatal, from pyæmia, on the fourteenth day, the tumour was found to contain bony plates and spicules, ecchymotic spots, and small clots. The gastrocnemius muscles were infiltrated, and secondary deposits were found in the lungs.

CASE VIII.<sup>5</sup>—A man, aged 36 years, after a severe strain, eighteen months previously, came under Mr. Bryant's care, for a painful, smooth, hard tumour of the hip, which was twice as large as its fellow. On excision, the head, neck, great trochanter, and upper part of the femur were found to be the seat of an alveolar sarcoma, which had invaded the acetabulum through the medium of the round ligament. On death, on the fourth day, the pleura, liver, and kidney, were seen to contain, each, a metastatic nodule; the adductors of the thigh and

<sup>1</sup> Cases of Teinturier and Mercier.

<sup>2</sup> Cases of Teinturier, Bryant, Poland, and Weil.

<sup>3</sup> Case of Teinturier.

<sup>4</sup> Teinturier, ante.

<sup>5</sup> Bryant, Guy's Hosp. Rep., ser. 3, vol. xx. p. 360.

Spontaneous inflammation of these tumours is rare. In the case of Poland,<sup>1</sup> the thinned and discolored skin gave away at several spots, through which offensive fungous masses protruded. Traumatism, however, is very liable to provoke inflammatory changes, as was witnessed in the case recorded by Teinturier,<sup>2</sup> in which exploratory puncture was followed by adhesion and superficial ulceration of the skin.

Round-celled sarcomas occur more frequently in the diaphyses of the long bones than do the other forms of sarcoma, the proportion being 33.33 per cent. against 27.27 per cent. for the spindle-celled, and 5.71 per cent. for the giant-celled growths. Their seat in twelve cases was in the

Femur, upper epiphysis, in 3 cases, lower epiphysis, in 2 cases, shaft, in 2 cases.	
Tibia, " " 1 "	" 1 "
Humerus, " " 2 "	" 1 "

Seven cases occurred in females, and five in males. In only two was traumatism assigned as the exciting cause of the disease.

The age at which they were first noticed was, respectively, 9, 19, 19, 22, 24, 27, 28, 32, 34, 35, 40, and 46 years, the average being 28 years, which corresponds very closely with the average age at which giant-celled sarcomas are first observed, although it is eight years earlier than the mean age of occurrence of spindle-celled tumours. They are not so common before the thirtieth year, by 8 per cent., as are myeloid sarcomas, but they are more common before that age, by 20 per cent., than are the spindle-celled tumours.

Round-celled sarcomas grow more rapidly than any other neoplasm of the osseous system, attaining the volume of a child's head in seven weeks,<sup>3</sup> or a diameter of seven inches in two months and a half,<sup>4</sup> or a circumference of thirty-four inches in three years,<sup>5</sup> the rate of increase being greatest in the soft, fluctuating tumours, and in the hemorrhagic forms. Their growth is continuous and not interrupted, and although it may be comparatively slow at first, it is sure to be quick before its final termination. One patient became pregnant and was delivered, at the full term, of a healthy child, during the progress of the disease, and, as the time advanced, the tumour "visibly increased in size every week." The rate of growth is also greatly influenced by traumatism, whether accidental or intentional, a blow, or exploratory puncture, for example, rendering its increase more acute.

The investing capsule is more liable to spontaneous perforation than in the other forms of central sarcoma. In the cases of Nélaton, and Billroth, the growths also surrounded the shafts of the bones, and in that of Teinturier the tumour protruded into the ham. Fracture of the capsule, through which the surrounding soft structures are liable to become involved.

<sup>1</sup> Ante.

<sup>2</sup> Bull. Soc. Anat. de Paris, ser. 2, vol. xii. p. 491.

<sup>3</sup> Case of Weil.

<sup>4</sup> Case of Nélaton, op. cit. p. 325.

<sup>5</sup> Case of Poland.

the seat of rich cellular infiltration, through which they lose their powers of resistance, become varicose, and finally rupture.

A most striking illustration of sarcomatous blood-cyst, or of hemorrhagic sarcoma, as it is more properly denominated by Virchow, is that recorded by Dr. Weil from the practice of Professor Heine, which presents many points of interest to the pathologist and to the practical surgeon.

CASE VI.—A tailor, aged 19 years, without assignable cause, experienced continuous pain in the left shoulder, which was followed, in fourteen days, by the appearance of a round, firm, fixed, painful tumour in the vicinity of the acromio-clavicular articulation, which in eight days attained the size of a fist and became softer. On admission, or seven weeks after he first experienced pain, the shoulder was the seat of a round tumour of the volume of a child's head, which was, for the most part, soft and fluctuating. The temperature was elevated, the skin was stretched and slightly discolored at one point, and the subcutaneous veins were much enlarged. The swelling was first thought to be a periosteal abscess, but during the next few days, the progressive increase of the growth, and the spontaneous fracture of the surgical neck of the humerus, did much to clear up the diagnosis.

On exploratory incision, which gave vent to much blood, the finger passed into a cavity filled with coagula and broken-down tissue, and the soft tumour felt like a sponge protruding from the broken head of the bone. Amputation at the shoulder-joint was practised two days later, but despite the fact that the axillary artery had, as a preliminary step, been ligated in the first portion of its course, it continued to bleed, and it, as well as upwards of twenty smaller vessels, had to be secured. The infiltrated deltoid muscle, as well as a portion of the great pectoral, and the spine of the scapula required removal.

Fourteen days subsequently, local recurrence was observed to have taken place in the subclavicular region, corresponding to the stump of the great pectoral muscle. The round tumour, which also consisted of blood and broken down tissue, was excised, and the patient was discharged six weeks and a half after the arm had been removed.

On dissection, the growth was found to have originated in the head of the humerus, and to have converted all the soft tissues around the upper third of that bone into a soft hemorrhagic mass. Numerous vessels, many of which were of the size of the radial artery, opened on the inner surface of the cyst, which was partly lined by a lardaceous membrane, and partly limited by softened tissue, both of which were pervaded by thrombosed vessels. Minute examination of the peripheral portions of the tumour showed it to be a very vascular round-celled sarcoma, undergoing, in its softer portions, myxomatous degeneration. The adventitia of the vessels was infiltrated with similar cells in a state of fatty degeneration.

In the case of Mr. Butler, the inner condyle of the femur and the soft, spongy tumour contained within it had been fractured, and the walls of the blood-cyst were formed by the thickened periosteum.

Round-celled sarcomas are liable to the same degenerations as the other forms of central sarcoma. Of these the myxomatous and fatty are the most common. They not infrequently coexist, and give rise to rapidly-growing and enormous tumours, and by rendering them soft and succulent, greatly increase the probability of metastatic deposits in distant organs. Calcareous and ossific transformations are met with in about 17 per cent. of all cases, and hyaline degeneration of the bloodvessels in 9 per cent. In connection with the former, it is interesting to note that one of the two cases in which it occurred was characterized by secondary growths in the lungs.

enough included the osteoid tumour of Müller among the homœomorphous or benign formations; and Stanley,<sup>1</sup> in 1849, designated the disease "Malignant Osseous Tumour." In their works which appeared between 1852 and 1857, Gerlach,<sup>2</sup> Paget,<sup>3</sup> Schuh,<sup>4</sup> Wedl,<sup>5</sup> and Rokitsansky,<sup>6</sup> described the calcifying and ossifying sarcomas as "Osteoid Cancer;" but, in 1858, Volkmann<sup>7</sup> again made the distinction between osteoid sarcomas and osteoid carcinomas, in which view he was sustained by Virchow,<sup>8</sup> and since that date the majority at least of so-called osteoid cancers are classed among the sarcomas by the German pathologists.

Among the more recent writers, Green<sup>9</sup> and Arnott<sup>10</sup> very properly speak of osteoid cancer as a variety of sarcoma; while Wilks and Moxon,<sup>11</sup> on insufficient grounds, as it appears to me, are inclined to believe that most of these tumours are osteoid chondromata. Cornil and Ranvier<sup>12</sup> describe ossifying sarcomas and ossifying enchondromas, and, with Virchow, treat of osteoid chondroma as a variety of cartilaginous tumour, the structure of which is similar to that found beneath the periosteum of rachitic bones.

To add still more to the existing confusion, Broca<sup>13</sup> regards these growths as periosteal exostoses developed in cancerous subjects; and Holmes<sup>14</sup> describes a remarkable example of constantly recurring osteoid sarcoma under the title of "Diffused bony, or innocent osteoid, tumour," which is included by Paget in his description of osteoid cancer. Paget,<sup>15</sup> indeed, still believes "that the most probable view of the nature of osteoid cancers would be expressed by calling them ossified fibrous or medullary cancers, and by regarding them as illustrating a calcareous or osseous degeneration." His opinion, however, is based upon the course pursued by the disease, and not upon histological features, since the minute structure, as depicted by him, corresponds in nowise with that of carcinoma. How many of the cases which I have analyzed are included in his history of these growths, I am unable to say; but that he has mistaken sarcoma for carcinoma is rendered quite certain by his reference to a case in which microscopic examination, made by Dr. Hillier, disclosed "fibroplastic growths, with abundance of elongated nuclei, and most perfect

<sup>1</sup> A Treatise on Diseases of the Bones, p. 163.

<sup>2</sup> Der Zottenkrebs und das Osteoid, Mainz, 1852.

<sup>3</sup> Op. cit., 1st ed., 1853.

<sup>4</sup> Path. und Ther. der Pseudoplasmen, pp. 147 and 425.

<sup>5</sup> Grundzüge der Path. Histologie, 1854, p. 639.

<sup>6</sup> Wochenblatt d. Zeitschrift d. Wiener Aerzte, Jahrg. 3, No. 1, 1857.

<sup>7</sup> Bemerkungen über einige von Krebs zu trennende Geschwülste, Halle, 1858.

<sup>8</sup> Deutsche Klinik, No. 49, 1858, p. 481.

<sup>9</sup> An Introduction to Pathology and Morbid Anatomy, Phila., 1876, p. 114.

<sup>10</sup> The Histology and Diagnosis of Cancer, 1872, p. 57.

<sup>11</sup> Lectures on Pathological Anatomy, Phila., 1875, p. 54.

<sup>12</sup> Op. cit. pp. 129 and 217.

<sup>13</sup> Traité des Tumeurs, Paris, 1866, vol. i. p. 97.

<sup>14</sup> A System of Surgery, 2d ed., vol. iii. p. 825.

<sup>15</sup> Op. cit., 3d ed., p. 759.

specimens of fibre cells."<sup>1</sup> In other words, the neoplasm was a calcifying spindle-celled sarcoma.

From his description of its minute appearances, it would appear that the osteoid cancer of Paget is composed mainly of dense fibrous tissue, with which are sometimes mingled, as if imbedded in the interstices of the fibres, cancer cells "not differing from those of common scirrhus cancers in anything, unless it be that they are smaller and less plump." On the addition of acetic acid "the fibrous tissue becomes clearer, and we find abundant nuclei imbedded in it," which are generally oval, and from  $\frac{1}{2000}$  to  $\frac{1}{3500}$  of an inch in length. From this account I am disposed to regard such a structure as being identical with the fibronucleated tissue of Bennett, which Paget<sup>2</sup> himself believes to be nearly related to that of the recurring fibroid tumours, and is included by Virchow in his group of spindle-celled sarcoma. That the fibrous tissue should present such peculiar appearances as those shown at *c*, Fig. 126,<sup>3</sup> may readily be explained by the fact, as I shall show presently, that the most of these tumours are really examples of fibrous sarcomas, the intercellular fibrous element of which is sclerosed, or thickened and condensed, while the cells have disappeared through fatty changes and atrophy, or have possibly been converted into bone corpuscles. At *b*,<sup>3</sup> the fibrous tissue forms a delicate reticulum which is indistinguishable from that of the lymphadenoid variety of round-celled sarcoma, and, I believe, that the tumour from which the drawing was made was, in reality, an example of that form of sarcomatous tissue. In none of these illustrations, nor in the text, is there anything pointing to an alveolar arrangement of the stroma, with included epithelial cells, so that the conclusion is inevitable that the distinguished observer has described osteoid sarcoma under the head of osteoid cancer.

In several of the cases that I have collected with the view of writing the general pathology of osteoid sarcoma, the minute structure agreed with the description of Paget; but the majority consisted of spindle-celled tissue.<sup>4</sup> Thus, of 21 instances, 14 were of that nature, while 5 were round-celled, and 2 were mixed growths, or composed of spindle and round elements in about equal proportions, thereby confirming the statements of Billroth,<sup>5</sup> Förster,<sup>6</sup> Senftleben,<sup>7</sup> Virchow,<sup>8</sup> and Carrera,<sup>9</sup> that they are

<sup>1</sup> Trans. Path. Soc., London, vol. vi. p. 317.

<sup>2</sup> Op. cit. p. 605.

<sup>3</sup> Op. cit. p. 762.

<sup>4</sup> I have not included in this account cases of osteoid chondroma, in which the tissue corresponds to that of membranous or osteoid cartilage; and I have omitted the cases of Gerlach, in which the minute structure resembled that of carcinoma, although I have every reason to believe that the tumours were osteoid alveolar sarcomas.

<sup>5</sup> Virchow's Archiv, vol. xviii. p. 87.

<sup>6</sup> Hdbch. der Path. Anat., 2d ed., vol. i. p. 387.

<sup>7</sup> Langenbeck's Archiv, vol. i. p. 155.

<sup>8</sup> Op. cit. p. 298.

<sup>9</sup> Tumeurs Fibroplastiques des Os, Thèse de Paris, 1865, p. 52.

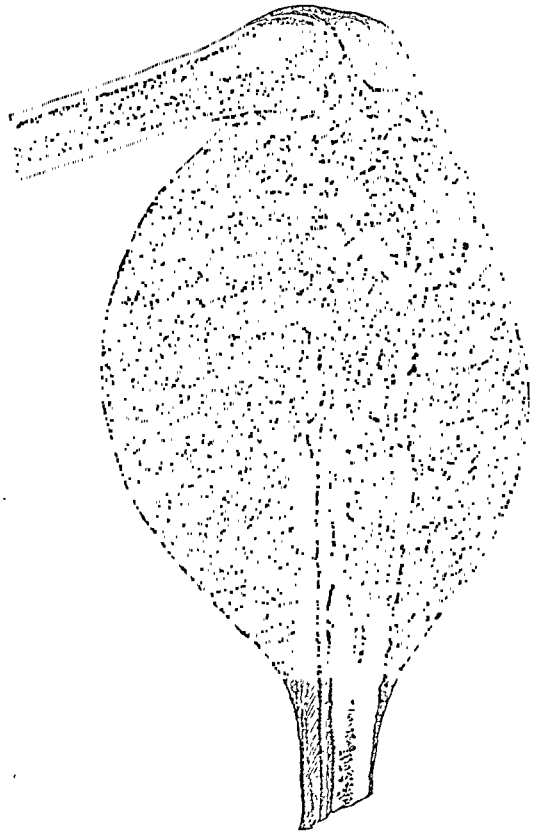
mainly calcified or ossified spindle-celled tumours, and not, as is curiously stated by Cornil and Ranvier,<sup>1</sup> for the most part, myeloid growths.

On section, osteoid sarcomas generally exhibit an interior calcified or ossified structure, surrounded and pervaded by unossified tissue, which may be dense, firm, and glistening, or soft and medullary, like the substance of the brain, or even semifluid and gelatinous. The osseous or cretified material usually radiates from the bone to the periphery of the tumour, in the form of fragile, delicate spicules, tufts, or plates, which are closely aggregated at their bases, and pursue a parallel course perpendicular to the surface of the affected bone, or diverge towards the circumference.

In other specimens, as in No. 317 of the Mütter Museum, the implicated femur looks as if it had been the seat of inflammatory irritation, being much roughened and elevated into thick and short osteophytic vegetations, which are inseparably connected with the compact tissue of the femur, and represent a true hyperplastic process. Again, the ossified portion of the growth may form a huge mass of what looks like spongy bone, as in No. 103, of the humerus. In other examples, the appearances are those of dense ivory-like bone, or, as is illustrated by Nos. 198 of the humerus and 1609 of the tibia, the latter of which is reproduced in Fig. 8, the tumour is principally composed of a collection of large tubers or nodules, which are as fragile as dried mortar.

In the majority of instances, the intercellular substance is simply calcified or petrified, so that the cellular elements are clearly displayed on the addition of chlorohydric acid. In others, or in parts of the same specimen, the tumour is pervaded by imperfect bone. Hence, Grohe<sup>2</sup> divides osteoid sarcomas into spongoid and ossifying sarcomas; the former being characterized by calcareous infiltration, and the latter by the formation of

Fig. 8.



<sup>1</sup> Op. cit., vol. ii. p. 375.

<sup>2</sup> Bardleben's Lehrbuch der Chir., etc., 6th ed., vol. i. p. 580.



new bone. Such a distinction, however, is entirely superfluous; since calcification is the initial stage of ossification, and the clinical features and prognosis of both forms are identical, although Cornil and Ranvier<sup>1</sup> erroneously state that ossifying sarcomas are benign affections, while calcifying sarcomas are to be regarded with suspicion.

As happens in the other varieties of periosteal sarcomas, the bone upon or around which the tumour grows is usually not involved in the disease, but in about 40 per cent. of all cases the subjacent medullary canal or spongy substance of the epiphysis is the seat of similar deposits. In some instances the internal and external tumours communicate by an opening in the compact tissue of the bone; but, as a rule, the latter remains entire, although it is sometimes the seat of infiltration; when infection of the marrow seems to have taken place along the Haversian system. These changes are well shown in Fig. 8, in which the head of the tibia and the upper half of the shaft are invaded by the morbid material which originated in the periosteum. From a practical point of view, it should be remembered that the medulla may be affected not only at the immediate seat of the tumour, but at some distance beyond. Thus, in a case of Stanley,<sup>2</sup> in which amputation was practised in the upper third of the thigh for an osteoid sarcoma of its lower third, on death, a circumscribed nodule was discovered in the bone of the stump; and in a still more remarkable example,<sup>3</sup> recorded by that surgeon, of a tumour of the upper portion of the tibia, the entire medullary canal of the femur was occupied by deposits of ivory-like bone.

Osteoid sarcomas are liable to the same degenerations and combinations as are the other varieties of the group. Of these, the most common are the cartilaginous and myxomatous; the former occurring in 20 per cent. and the latter in 12 per cent. of all cases.

They are not very vascular; but in 14 per cent. of all instances,<sup>4</sup> and especially when they have undergone fatty and myxomatous degeneration, they are the seat of more or less extensive extravasations of blood. Of these, the most striking example is that recorded by Weil, and it is very similar to his case of central hemorrhagic round-celled sarcoma of the humerus, which I have already quoted. The tumour, which was only of six weeks' duration, was converted into a cyst, as large as the two fists, and filled with blood. On attempting to preserve the limb by excision of the sac, twenty-five large arteries and veins required ligation, and the femoral artery had to be taken up before the hemorrhage ceased. On death from consecutive amputation, sixteen weeks after the first appearance of

<sup>1</sup> Op. cit., vol. i. p. 143.

<sup>2</sup> Op. cit. p. 169.

<sup>3</sup> Op. cit. p. 165, and Illustrations, plate 19.

<sup>4</sup> Cases of Weil, *Prager Vierteljahrsschrift*, vol. iv., 1877, p. 5; Volkmann, *op. cit.* p. 19; De Morgan, *Trans. Path. Soc., London*, vol. xxi. p. 337; Arnott, *ibid.*, vol. xxii. p. 214; and Wagstaffe, *ibid.*, vol. xxiv. p. 183.

the tumour, metastatic deposits were found in the lungs, pleura, liver, kidneys, sternum, and parietal bone. In the case of Wagstaffe, which was also undergoing myxomatous degeneration, large vessels could be traced in close contact with the walls of a huge cyst which occupied the superficial portion of the tumour. The progress of the disease was not, however, so rapid as in the former instance, as the total duration of life was ten months. The lungs, pleura, liver, and spleen were the seat of secondary growths.

In an instance described by Stanley,<sup>1</sup> the femoral artery was tied on account of a pulsating osteoid sarcoma of the lower end of the femur, with the effect of arresting the pulsation and temporarily impeding its growth; and Sedgwick<sup>2</sup> has recorded a remarkable example of pulsation and bruit seated in a bony metastatic tumour of the clavicle, which appeared to be independent of the subclavian artery. The primary growth was "full of large vessels."

Spontaneous inflammation, ulceration, and fungous protrusion occur in only about 11 per cent. of all cases, these accidents having been observed by Howship,<sup>3</sup> Stanley,<sup>4</sup> Lebert,<sup>5</sup> and Hillier.<sup>6</sup> In the case of Howship the fungus was the seat of repeated and exhausting hemorrhages. Ulceration and gangrene are, however, extremely liable to follow surgical interference as for example, the application of the actual cautery, under the supposition that the disease is white swelling, of which occurrence an instance is recorded by Volkmann,<sup>7</sup> or an exploratory incision or puncture, of which cases are reported by Wilks,<sup>8</sup> Virchow,<sup>9</sup> and Volkmann.<sup>10</sup>

Peripheral osteoid sarcomas are most common on the bones of the lower extremity, and evince a predilection for their expanded articular ends. Thus of 45 cases of which I have examined specimens or collected histories, the femur was affected in 24, the tibia in 13, the fibula in 2, the humerus in 5, and the radius and ulna in 1.

Of 39 cases in which the sex is noted, 24 occurred in men and 15 in women, 47 per cent. of whom traced the disease to traumatism, and 6 per cent. to rheumatism.

Their greatest frequency is before the thirtieth year. The youngest patient was twelve years of age, and the oldest fifty-five years at the time of the first manifestation of the tumour, the average age being 22.6 years. These facts are set forth in the following table:—

<sup>1</sup> Op. cit. p. 167.

<sup>2</sup> Brit. and For. Med.-Chir. Rev., vol. xvi. p. 205.

<sup>3</sup> Pract. Obs. in Surgery, etc., p. 443.

<sup>4</sup> Traité d'Anat. Path., vol. ii. p. 592.

<sup>5</sup> Guy's Hosp. Rep., ser. 3, vol. iii. p. 155, case i.

<sup>6</sup> Op. cit. vol. ii. p. 304.

<sup>7</sup> Op. cit. p. 167.

<sup>8</sup> Ante.

<sup>9</sup> Op. cit. p. 16.

<sup>10</sup> Op. cit. p. 19.

Age.	No. of Case
10 to 20 . . . . .	18
20 " 30 . . . . .	15
30 " 40 . . . . .	3
40 " 50 . . . . .	2
50 " 60 . . . . .	1
	<hr/> 39

Their growth is progressive and continuous, and usually so rapid that they may attain the volume of a double fist in six weeks<sup>1</sup>, or a circumference of twenty-five inches in six months,<sup>2</sup> particularly if they be the seat of interstitial hemorrhage or mucoid changes. Independently of these alterations, they may be as large as a cocoanut in four months,<sup>3</sup> or have a diameter of eight inches in fourteen weeks,<sup>4</sup> or increase at the rate of half an inch a week.<sup>5</sup>

During their further progress, osteoid sarcomas evince a disposition to extend beyond their limiting capsules and invade the surrounding structures. As I have already pointed out, the medulla of the affected bone is involved in 40 per cent. of all instances. The soft tissues are implicated in 30 per cent., the skin, however, as a rule, preserving its mobility and natural colour, being red, thinned, or ulcerated in only 20 per cent. of all cases. In one case only was a contiguous vein occluded by the morbid material, thrombosis of the axillary vein having occurred in connection with a tumour of the upper end of the humerus.<sup>6</sup> In 6 per cent. of the cases the growth made its way into the adjacent joint, but the cartilages remained intact.<sup>7</sup>

Primary implication of the associated lymphatic glands is recorded in only seven instances, or in 21.87 per cent. of all cases. In four the enlargement was due to irritation; in two the glands were converted into osteoid tissue,<sup>8</sup> while in the remaining one the structure was not noted.

Not only are osteoid sarcomas locally infectious, but they are next to the pure periosteal spindle-celled the most malignant of all the neoplasms of the osseous system, since 65.62 per cent. of all cases die, sooner or later, with metastatic deposits, no matter whether they have been subjected to operation or not. Thus of 33 instances, of which the terminations are recorded, in 7 the affection pursued a natural course, and of these, in one the viscera was not examined, while in four the internal organs were affected. Of 26 operations, 1 was fatal from septicæmia without metastatic deposits; 6 lived, and 19 subsequently died. In 17 of these the disease was generalized, and in 2 it recurred locally several times:

<sup>1</sup> Weil, ante.

<sup>2</sup> Wagstaffe, ante.

<sup>3</sup> Jackson, Trans. Path. Soc., London, vol. xvii. p. 209.

<sup>4</sup> Küster, Langenbeck's Archiv, vol. xii. p. 630.

<sup>5</sup> Sedgwick, ante.

<sup>6</sup> Virchow, op. cit. p. 304.

<sup>7</sup> Holmes and Volkmann, ante.

<sup>8</sup> Stanley, op. cit. p. 168, and Paget, op. cit. p. 761.

The duration of life in the 7 cases<sup>1</sup> which ended in death without surgical intervention averaged sixteen months. Two died in the first year; three in the second year; and in two the patients lived only a "short time."

Of the 6<sup>2</sup> that recovered from amputation, and remained well without local or general return, the average duration of life was 58 months, the shortest period having been seven weeks, and the longest twenty years.

Of the remaining 20 operations<sup>3</sup> all of which were amputations, except one instance of ligation of the femoral artery, and one of excision of the upper half of the fibula, strange to say, only one died. The rest recovered and lived for periods which varied from four months to twenty-five years. In 17 of these, metastatic deposits were discovered, and in 7 there was local recurrence at the site of the operation, while 2 died of local recurrence, without any indications of visceral complications. In 13 of these cases, of which I have accurate accounts, the total duration of life averaged 92.7 months, or seven years and eight months. Thus, four died in the first year, three in the second year, one in the fourth year, and one in the sixth year, while one lived for seven and a half years, one for eighteen years, one for twenty-four years; and one for twenty-five years.

In the majority of instances the secondary deposits were also calcified or ossified. Their seat was in the

Lungs	in 16 cases.	Skin	in 1 case.
Lymphatic glands	" 7 "	Liver	" 1 "
Bones	" 7 "	Omentum	" 1 "
Diaphragm	" 3 "	Subcutaneous tissue	" 1 "
Pleura	" 3 "	Spleen	" 1 "
Pericardium	" 2 "	Superior cava	" 1 "
Kidney	" 2 "	Perichondrium	" 1 "
Brain	" 1 case.		

Not only are the periosteal osteoid sarcomas next to the other peripheral varieties more destructive to life than other tumours of bones, but they are more malignant than the central osteoid sarcomas. Thus of 12

<sup>1</sup> Cases of Wilks, op. cit.; case iv. p. 157; Hillier, ante; Volkmann, op. cit. pp. 14 and 19; Küster, ante; Howship, ante; and Virchow, op. cit. p. 304.

<sup>2</sup> Cases of Norton, Trans. Path. Soc., London, vol. xxiii. p. 179; Nicaise, Bull. et Mém. de la Soc. de Chirurgie, vol. ii. 1876, p. 212; Wilks, op. cit., case of John T., p. 158; Jackson, Trans. Path. Soc., London, vol. xvii. p. 209; Grohe, Bardleben's Lehrbuch, 6th ed., vol. i. p. 582, and Berend, Deutsche Klinik, 1860, pp. 208 and 217, and Virchow, op. cit., vol. ii. p. 313.

<sup>3</sup> Cases of Weil, ante; Danzel, Langenbeck's Archiv, vol. xv. p. 72; Verneuil, Bull. de la Soc. Anat., vol. xxix. p. 262; Wagstaffe, ante; Birkett, Guy's Hosp. Rep., ser. 3, vol. iii. p. 336; Paget, op. cit. p. 767; Wilks, op. cit. pp. 155-158; Sedgwick, ante; Stanley, op. cit. pp. 165-168; Senftleben, Langenbeck's Archiv, vol. i. p. 167; Arnott, Trans. Path. Soc., London, vol. xxii. p. 214; Baum, Virchow's Archiv, vol. xviii. p. 86; Bennett, Cancerous and Canceroid Growths, p. 103; and Holmes, ante.

examples of ossifying myelogenic giant, spindle, and round-celled sarcomas 50 per cent. gave rise to metastatic deposits, while 65.62 per cent., of the peripheral form were attended with or followed by systemic infection.

Although generalization may ensue in so short a period as four months, as happened in the case of Weil, it may be deferred for many years, or even not occur at all. Thus in a case of Stanley's,<sup>1</sup> the disease had existed for eighteen years, but on death, two months after removal of the limb, metastatic tumours were found in the pleura, lungs, pericardium, and superior vena cava. In the case of Mr. Plympton, recorded by Paget,<sup>2</sup>

"a swelling appeared in the upper arm of a woman thirty-two years old. After ten years' growth, when it had increased to seven pounds weight, it was removed by Mr. Hewson. It had the characters of osteoid cancer. The patient completely recovered from the operation; but, about a year after it, a new tumour appeared about the humerus, and at the end of four years had acquired a huge size, and a weight of fifteen and a half pounds. For this, which proved to be a similar osteoid growth, the arm was amputated at the shoulder-joint. She recovered from this operation also; but the disease returned in the scapula, and, in about ten years after the amputation, and twenty-four years from the beginning of the disease, she died."

Not less remarkable is the case described by Holmes:—<sup>3</sup>

"The thigh was originally amputated on account of a hard and heavy dry osseous substance surrounding the ends of the femur and tibia, projecting into the knee-joint, extending far up the thigh, and surrounding the popliteal artery, vein, and nerve, so as to cause œdema and severe pain. The patient remained well for five years; then another osteoid tumour formed on the stump of the femur, accompanied with severe pain. Amputation was performed higher up. The tumour appeared to grow, not from the bone itself so much as from the periosteum, and inclosed the femoral artery. There was again an interval of health for two years; then a fresh tumour formed about the stump, continued to increase upwards out of reach of operation, and finally killed him from inflammation and sloughing of its soft coverings, twenty-five years after the first appearance of the disease. He had been in good general health during the whole time."

Peripheral osteoid sarcomas begin with pain in 62.5 per cent., with a tumour in 33.33 per cent., and with simultaneous pain and swelling in 4.16 per cent. of all cases. Suffering, which is aggravated by exercise, and liable to severe exacerbations, is so constantly present, that its entire absence is noted in only one instance. In the commencement it is not great, but as the tumour grows, it becomes intense, particularly at night; affects the general health, and is the cause of death in the majority of instances.

Like the uncalcified or unossified periosteal sarcomas, the osteoid variety gives rise to pyriform, or long-oval, oblong, or fusiform tumours, which are smooth and even on their surface, except when they have burst through their capsules, when they are nodulated, bosselated, or lobed. Their consistence is usually firm and dense, although it may be firm at some points and soft and even fluctuating at others. The skin, when the mass is not interfered with, is altered in only 20 per cent. of all cases, being tense

<sup>1</sup> Ante, p. 165.

<sup>2</sup> Ante.

<sup>3</sup> Ante.

and discolored, or ulcerated in about an equal number of instances. Now and then the bony spicules may be seen at the bottom of the ulcer. The subcutaneous veins are enlarged in 31 per cent.; the lymphatic glands are involved in 21 per cent.; the temperature is elevated in 6 per cent.; pulsation is present in rather less than 3 per cent.; and fracture from slight causes occurs in 3 per cent of all cases.

From the above considerations it follows that a hard, rapidly-growing, painful, and non-pulsating tumour, developed at about the twenty-second year, and unaccompanied by fracture or discoloration of the skin, but attended, possibly, by enlargement of the superficial veins and lymphatic involvement, may be classed among the osteoid sarcomas. In the event of an associated gland being densely hard, or of the existence of bony matter in the bottom of an ulcer, its nature is unmistakable.

*The Differential Diagnosis of Periosteal Sarcomas.*—For purposes of comparison I have drawn up the following table of the clinical features of the periosteal sarcomas, from which it will be seen that there are essential points of distinction. The longer duration of life in the osteoid variety is accounted for by the cases in which the patients lived many years after operation. Were these deducted there would be little difference in the prolongation of life in the three divisions.

	Round-celled.	Spindle-celled.	Osteoid.
Relative frequency . . . .	19.40 p. c.	13.43 p. c.	67.16 p. c.
Occur before 30th year . . . .	63.63 "	66.66 "	91.66 "
Seated around shaft of the long bones . . . .	69 "	55. "	39 "
Ushered in by pain . . . .	55 "	85.71 "	62 "
" " swelling . . . .	44 "	14.29 "	33 "
" " " and pain . . . .	0 "	0 "	4 "
Pain throughout the disease . . . .	66 "	100 "	98 "
Skin variously altered . . . .	51 "	22.22 "	20 "
Subcutaneous veins enlarged . . . .	41 "	33.33 "	31 "
Infection of adjacent tissues . . . .	50 "	44 "	40 "
Lymphatic glands tumefied or involved . . . .	38.46 "	11 "	21 "
Metastatic deposits . . . .	66.66 "	100 "	65.62 "
Local recurrence . . . .	50 "	60 "	41 "
Pulsation . . . .	0 "	0 "	3 "
Fracture, spontaneous, or from slight causes . . . .	7 "	11 "	3 "
Joints invaded . . . .	15.38 "	0 "	6 "
Duration of life without operation . . . .	?	?	16 mos.
" " with operation . . . .	18 mos.	20 mos.	92.7 "
" " " and still alive . . . .	34 "	0 "	58 "

The distinction between the periosteal chondromas and periosteal sarcomas is based upon the following features: The former are relatively far more common, as they constitute 86 per cent. of all cartilaginous tumours of the long bones, while only 41 per cent. of sarcomas are of peripheral origin. They are far less painful, of slower growth, of denser consistence, and are, as a rule, nodulated. They are usually met with in females; do

not occur so early in life, but are met with at a more advanced age than are the sarcomas; and appear, on an average, four years sooner than the latter. The subcutaneous veins are not so liable to enlargement; the overlying integuments evince little disposition to inflame or ulcerate; they do not pulsate, fungate, invade the joints, or contaminate the glands, and they occasion secondary deposits only one-twentieth as often. In about one-third of all cases, moreover, other portions of the skeleton are simultaneously affected, while multiplicity is not witnessed in the sarcomas.

These differences in their principal signs may be the better appreciated by a reference to the following table:—

#### PERIOSTEAL CHONDROMA.<sup>1</sup>

1. Constitutes 86 per cent. of all cartilaginous tumours.
2. Appears between the tenth and sixty-first years, or, on an average, at the age of twenty-six.
3. 63 per cent. of all cases occur in females.
4. Grows comparatively slowly.
5. Usually begins insidiously, but pain is present throughout in 47 per cent. of all cases.
6. The subcutaneous veins are dilated in 21 per cent. of all cases.
7. The skin is variously altered in 10 per cent. of all cases.
8. The lymphatic glands are free from enlargement.
9. Spontaneous fracture, or fracture from slight causes, is met with in 5 per cent. of all cases.
10. Metastatic deposits occur in 3.17 per cent. of all cases.
11. Never pulsates.
12. Does not invade the joints.
13. Is multiple in 32.8 per cent. of all cases.

#### PERIOSTEAL SARCOMA.<sup>2</sup>

1. Constitutes 41 per cent. of all sarcomas.
2. Appears between the seventh and fifty-fifth years, or, on an average, at the twenty-second year.
3. 38 per cent. of all cases occur in females.
4. Rate of growth is more rapid.
5. Usually ushered in by pain, and pain throughout in 94 per cent. of all cases.
6. The subcutaneous veins are dilated in 30 per cent. of all cases.
7. The skin is altered in 25 per cent. of all cases.
8. The lymphatic glands are enlarged in 22 per cent. of all cases.
9. Fracture occurs in 5 per cent. of all cases.
10. Metastatic deposits occur in 69.04 per cent. of all cases.
11. Pulsation met with in 1.8 per cent. of all cases.
12. Joints involved in 7 per cent. of all cases.
13. Is never multiple.

In regard to the distinction between periosteal sarcoma, and white swelling of the joints, I have nothing to add to what I have already stated in my remarks upon sarcoma in general.

When it is remembered that not only the soft parts and the corresponding portion of the medulla of the bone around which the tumour is seated

<sup>1</sup> Based upon an examination of sixty-three cases.

<sup>2</sup> Based upon an examination of fifty-six cases.

are liable to be invaded by the morbid product, but that nodules of sarcomatous tissue may exist in the medullary canal at some distance from the original growth, the line of practice to be followed in the periosteal sarcomas is to amputate as far as possible from the seat of the disease as may be consistent with the patient's safety. Thus, for example, the limb should be removed at the knee for a tumour occupying the lower end of the tibia or fibula; the thigh should be amputated close to the lesser trochanter for a growth involving the lower third of the femur; and if the soft tissues or medulla are found to be infiltrated, disarticulation at the hip should at once be resorted to. When the neoplasm is seated near the trunk, the case had best be left to pursue its natural course, since experience shows that local recurrence, as after amputation at the shoulder, nearly always, if not constantly, ensues.

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### ARTICLE III.

FOUR CASES OF OVARIAN TUMOUR AND ONE OF FIBRO-CYSTIC TUMOUR OF THE WOMB, OPERATED ON UNDER THE SPRAY. By WILLIAM GOODELL, M.D., Professor of Clinical Gynæcology in the University of Pennsylvania.

No operations on the human body offer so much of interest to the profession as those involving the cavity of the peritoneum. The vulnerability of this membrane, the important organs which it contains, and the fatal character of the diseases for the relief of which its sanctity is invaded, make the record of every case imperative.

Again, while antiseptic ovariectomy has been resorted to with wonderful success by Wells, Keith, Thornton, Bantock, Olshausen, Shroëder and by other European ovariectomists, it has been strangely neglected by our own. Isolated cases are the only ones which appear in our journals, and I shall therefore offer no apology for giving my own experience, limited though it be, with antiseptic laparotomy.

CASE I.—J. M., aged 53, and single, reached the climacteric in 1872. In March, 1877, a tumour appeared in the uterine region, which grew rapidly. It gave her no inconvenience except from its bulk. I saw her first early in September, 1878, and found her much emaciated and her abdomen enormously distended by an ovarian cyst. She was otherwise in very fair health, and had come eight miles to see me. The womb lay to the left and behind the tumour. It measured 3.5 inches, but was movable. The operation was performed at 11 A. M., Oct. 27th, in a small private room of the hospital of the University of Pennsylvania, and I was assisted by Drs. J. Ashhurst, B. F. Baer, W. L. Taylor, and Richard H. Harte. There were also present Drs. A. H. Smith and W. S. Forbes, and six students.

There being many parietal adhesions the incision was carried up two



inches above the umbilicus. The tumour consisted of one large cyst and many smaller ones. It involved the right ovary, the left one being healthy, but atrophied. A short and broad stalk was transfixed, tied on either side and dropped back into the abdominal cavity. At 8.30 P. M. I found her comfortable, with a pulse of 100, and a temperature of 101.5°.

The next day and the following one she seemed to be doing well, but on Oct. 30th septic symptoms set in. I removed three of the lowest stitches, introduced a flexible catheter, and irrigated the abdomen with a two per cent. solution of carbolic acid. This was repeated, large doses of opium and quinia were given, but to no purpose. She went from bad to worse, and died at 10 P. M., on the 31st inst.

I was very much disappointed at the issue of this case. It was my first one performed under the spray, and every detail of Lister's method was scrupulously carried out, even to the protective, the mackintosh and the antiseptic gauze. The room had been thoroughly cleansed, and a spray of carbolic acid kept up for many hours. The smell of this acid was indeed quite over-powering during the operation. The students present had, at my request, all bathed their persons that morning, and had put on clothes which they had never worn in the hospital wards and in the dissecting rooms. I, indeed, went so far as to forbid the presence of one of the resident physicians, because he had a case of typhoid fever in his wards. No one but myself touched the peritoneum, and I am sure that no poison was lurking about my person. The parietal adhesions were numerous, but readily broken, and not one needed a ligature. As oozing did not take place a drainage tube was not called for. Yet, in spite of the case being a favourable one, the operation an easy one, fatal septic peritonitis set in. Apart from the fact that the operation was performed in a general hospital, I am at a loss to account for the presence of poison germs. My confidence in antiseptic surgery was somewhat shaken, for I had previously had in the same hospital two cases of ovariectomy, a third of exploratory incision in which malignant disease of both ovaries was discovered, and a fourth of the removal of both ovaries for the cure of a fibroid tumour of the womb. All these operations were performed without any antiseptic precautions whatever, apart from cleanliness. Of these but one case died, and that was one of ovariectomy, in which a slight attack of peritonitis had supervened upon a previous tapping of the cyst.

CASE II.—S. C., a maiden lady, aged 40, was well until three years ago, when she, while drawing water from a well, was hit in the abdomen by the pump-handle. Shortly after this accident she discovered an abdominal tumour, which slowly increased in size until a few months ago, when its growth became more rapid. Her health now began to fail, and she rapidly lost flesh. Severe pains radiated from the pelvic regions, she lost her appetite, and became obstinately constipated. Some weeks ago Dr. A. H. Sheaffer, of Lewistown, aspirated the tumour and removed not more than two ounces of fluid. The tumour was productive of so much distress by its pressure on the bladder, on the rectum, and on the abdominal organs, that the woman was compelled to give up her trade of seamstressing and to live on the charity of her friends.

On April 30th, Dr. Sheaffer brought her to my office, and I found the following condition: A large but circumscribed tumour occupied the cavity of the abdomen. It yielded an obscure sense of fluctuation, and was somewhat movable. The sound gave a measurement of 2.75 inches to the womb, which evidently had a firm attachment to the tumour, for movements imparted to the one affected the other. The catamenia were regular, they lasted a week without being profuse, and were painful. The woman had grown very thin and her complexion had become muddy. She wore a very dejected expression, and presented the typical *facies uterina*. In view of the slow growth of the tumour, its solidity, its firm attachment to the womb and the very marked facial expression, my diagnosis was that of fibro-cystic tumour of the womb.

After a short preparatory treatment she was, on May 4th, operated upon in a private room at the hospital of the University of Pennsylvania, and I was aided by Drs. B. F. Baer, J. Roberts, W. L. Taylor, F. F. Scott, and B. L. Millikin. The carbolized spray was used, and every other antiseptic precaution taken. A few parietal and omental adhesions were found, but they offered no difficulty whatever. The tumour was of a darker hue than the sac of an ovarian cyst, and was fasciculated with fibrous bands. The colour was purplish rather than the characteristic blue-white or conjunctival blue of an ovarian cyst, and its surface was covered with large ramifying vessels. Palpation gave so distinctive a feeling of fluctuation that I twice tapped it—once with a trocar and once with an aspirator needle. To my surprise a few drachms only of fluid escaped. It was sherry coloured, and coagulated so firmly as to adhere to the vessels in which it had been received. The aspirator-needle wounded one of the large veins of the tumour, and a free and annoying bleeding followed. It could be stopped only by passing two sutures under the vein, above and below the wound.

Since the tumour could not be reduced in size, the abdominal incision was prolonged upward and downward until it reached from the pubic symphysis to very near the ensiform cartilage. As the tumour had no stalk, but sprang directly from the wall of the womb, I was obliged to enucleate it. The wire-loop of an ecraseur was accordingly thrown around the womb and tightened just enough to stop the circulation, but not enough to injure the flesh. A circular incision was then made through the capsule of the lower portion of the tumour, and, without the loss of a drop of blood, it was enucleated from the womb partly by cutting and partly with the handle of the knife. The cup-like capsule left behind was transfixed and tied on either side, and the wire-tourniquet removed from the womb. As the free end of this artificial stalk presented a raw funnel-shaped cavity large enough to admit a tea-cup, I was afraid that it would seal itself to neighbouring loops of intestines, and thereby produce dangerous obstruction. In order, therefore, to cover the raw surface by peritoneum, the edges were doubled over and stitched together by nine gut sutures. The stalk was now dropped back, and the abdominal wound closed by twenty-three silver sutures, each one of which included the peritoneum. A thick pad of salicylized cotton-wool was laid over the abdomen, and kept in place by long strips of adhesive plaster. Over all was pinned a flannel binder, and the patient was then put to bed.

For fear of vomiting and of inflammation the woman's food was reduced to the lowest possible amount—about a tablespoonful of milk and lime-water every hour. On the third day there was a slight rise in temperature,

which was controlled by an ice-cap. No other bad symptom occurred, and her convalescence was uninterruptedly good. The dressing kept perfectly sweet for a week, and was not disturbed until the eighth day, when, under the spray, the stitches were removed and a new batch of salicylized cotton was applied. The tumour was fibro-cystic in character, and full of small cavities like a geode. It weighed seven pounds.

After the fatal result of my first antiseptic case I had made up my mind not to operate in a hospital again, if I could help it, and I tried to get a room in a private house for this woman. But it was impossible, for the landladies asked a price too high for the purse of my patient. Besides, she was not able to pay for a nurse, and in a private house she would not have had the constant medical attendance which is so needful in these cases, and which hospital residents alone can give. So I was obliged to fall back upon the hospital, but with fear and trembling. This time, however, no medical students were allowed to be present, and but two by-standers. The room also was as far from the wards as possible.

I do not for a moment suppose that the blow received from the pump-handle had anything to do with the production of this tumour; but it called the woman's attention to her abdomen, and led her to discover a growth, which had already existed for months. The injury from the pump-handle, together with the morbid concentration of thought, which plays such an important part in the circulation and innervation of the reproductive organs, no doubt caused the rapid development of the tumour.

CASE III.—C. F., a widow of several years' standing, aged 44, began nearly two years ago to feel a lump in her left side. It grew rapidly until it had reached an enormous size, and greatly distressed her for breath. I was finally asked by her family physician, Dr. J. G. Bauman, of Telford, Pennsylvania, to operate. As she lived some forty miles out of the city, and as she was too unwieldy to come to me, I saw her for the first time on the day of the operation, the 31st of last May. The day was an excessively hot one, the temperature being 93°, and the room in which we operated a small one. I found a short woman, enormously distended by a tumour, which yielded no positive sense of fluctuation. The abdomen was fat-laden and œdematous. The cervix uteri protruded from the vulva, and the sound gave a measurement of five inches. As she continued to menstruate, and had never been tapped, the diagnosis was by no means certain, and, in fact, it rather leaned towards a fibro-cystic tumour. She was very nervous, and there came to comfort her a lady from whom the late Dr. Atlee had, some years before, removed an ovarian tumour. Her presence did the poor woman much good. The following gentlemen were present at the operation, the four former kindly giving me their aid: Drs. J. Thomas and I. S. Moyer, of Quakertown; J. E. Bauman, of Telford; B. F. Baer, of Philadelphia; W. Hartzell, Reinhard Keeler, V. Z. Keeler, and Henry G. Groff, of Harleysville, Pennsylvania.

Under the spray the abdomen was incised, and the tumour brought to view. There were many tough parietal and omental adhesions. All within reach were broken, and the cyst was tapped, but no fluid escaped. It was, therefore, incised, and the extremely tenacious, jelly-like contents were scooped out with the hands. As the tumour was polycystic, all could

not be removed, and, while I was breaking up the more deeply-seated adhesions, I found a large rent in the cyst, out of which protruded a mass of the colloid substance as large as my fist. Fearing it would escape into the peritoneal cavity, I enlarged the abdominal incision to a point about three inches above the umbilicus, and succeeded in turning out the cyst without any loss of its contents from the rent. The stalk was short and broad. It was transfixed, tied on each side with carbolized silk, the finest compatible with safety, and dropped back. Three bleeding surfaces on the omentum were tied with carbolized gut, the abdomen was closed by silver sutures, and the wound dressed with dry salicylized cotton. The cyst and its contents weighed forty-five pounds.

On June the 3d I received a note from Dr. Bauman, in which he wrote: "Our patient is getting along so far without a ripple of trouble. She has had no fever of any account; her abdomen seems not to be tender, nor much distended; her tongue is moist, and so is the surface of her body; her head is clear, and, if she were allowed to converse, she would do so freely." The dressings kept sweet until June 8th, when they and all the stitches but three were removed. At the next dressing, five days later, the wound was found wholly united, and the remaining stitches were removed. A few days later the woman was out of bed.

In this case the advantages of an antiseptic treatment were beautifully illustrated. Apart from the numerous adhesions, of which a more typical example will shortly be given, the belly-wall was fat and œdematous. So much so, indeed, that considerable serum glistening with oil-globules kept oozing out, and I had twice to twist tighter the sutures, which were loosened by the shrinkage of the flesh. Yet the long incision united by the first intention save at three suture points, the dressing kept sweet for a week, and the woman recovered, as Dr. Bauman wrote, "without a ripple of trouble."

CASE IV.—On June 11th, Drs. R. Hornor and J. M. Radebaugh, of Gettysburg, Pennsylvania, sent me a maiden lady of fifty, who about two years before had discovered a growth in her abdomen. On the 2d of last June she had become so unwieldy that these gentlemen tapped her, removing three gallons of a dark fluid, which, however, did not empty the tumour. One large fluctuating cyst remained, lying under the diaphragm, and wholly immovable. My diagnosis was a polycyst with extensive adhesions. The womb, of a natural size, was retroverted, and lay behind the tumour. On the morning of the 14th she took a dose of oil, and at night one grain of opium. The next morning she swallowed another grain of opium and ten grains of quinia. At eleven o'clock the operation was performed in one of the private rooms of the Hospital of the University; Drs. C. T. Hunter and L. Judd being present, and Drs. B. F. Baer, J. M. Radebaugh, W. L. Taylor, C. F. Palmer, and B. L. Milkin aiding me.

Owing to the adhesion of the cyst to the belly-wall there was some difficulty in determining where the peritoneum ended and the cyst-wall began; but this was overcome by cautious dissection, and the use of the uterine sound as a probe. Very firm and extensive adhesions to the omentum and to the abdominal wall embarrassed the dislodgment of the tumour. Some of these were too firm to be broken by the finger, and they were,

therefore, scratched through with Thomas's spoon-saw. The omentum was badly torn in the separation of its attachments, and several shreds of it had to be tied *en masse*. The cyst was found to be the right ovary. The left one proved to be sound. The stalk was short and broad. It was transfixed by a double ligature of silk, and tied on either side. Five gut ligatures were applied to as many bleeding vessels in torn adhesion-bands, but there were several broad oozing surfaces which could not be wholly staunched. I, therefore, did what I had before found efficacious in such cases: I put in a glass drainage tube, closed up the wound, and trusted to the elastic pressure of the flannel binder and of the cotton to stop the bleeding. This had the desired effect, and there was no further trouble.

June 15, 9 P. M. Pulse, 90; temperature, 99.4°; no vomiting; reaction perfect.

16th, 9 A. M. Temperature, 100°; pulse, 94. 9 P. M. Temperature, 101.5°; pulse, 100. Is taking every hour one tablespoonful of milk and lime-water. To reduce the danger of hyperpyrexia an ice-cap was ordered.

17th. Ice-cap kept on; temperature, 99.5°; pulse, 86.

18th. Temp. 98.5°; pulse, 80. The ice-cap being no longer needed was taken off.

19th. The temperature and pulse are the same as when last noted.

20th. Temperature, 98°; pulse, 74.

From this day everything went on so smoothly that there is no need of any special record. On the 22d, the dressing began to yield a slight odour, which, however, was perceived only when my nose was almost touching it. I, therefore, removed it, and also the drainage-tube, which had hitherto been untouched. A teaspoonful of sweet bloody serum escaped from the opening, which was now irrigated with a two per cent. solution of carbolic acid. All this was done under the spray. As the sutures were causing no ulceration, not one was cut. The wound was dressed as before with freshly-prepared salicylicized cotton. Three days later all the stitches were removed, and the lady made so rapid a recovery that, on the fifteenth day from the operation, she went in a carriage to a friend living two miles away from the hospital. On July 19 I was much surprised at meeting her at the Centennial Exhibition Building.

This case furnishes another strong proof of the advantages of antiseptic ovariectomy. In the first place, the parietal adhesions were extensive, and in some places so firm as to resist the finger. The omentum was so closely bound to the cyst, that in the efforts to free it merely a rag of it was left behind; in addition so torn was the little left that one of the gentlemen present compared it to a battle flag that had seen much service. Large oozing surfaces were unavoidably made, yet not an unfavourable symptom occurred, and the drainage-tube, which had been put in in anticipation of trouble, was never once uncorked. Then the long wound in the abdomen, which under ordinary dressings becomes offensive by the third day, kept sweet until the ninth. While this lady was in the hospital, another case was admitted in striking contrast with hers. In a quarrel a very muscular negro received a stab in the belly from a narrow-bladed knife. The wound was a small one, the viscera escaped injury, and yet, in spite of unremitting care, a peritonitis set in, which in eight and forty hours destroyed life. Nothing could better show the difference between the vulnerability

of healthy peritoneum and that of peritoneum changed by adhesions, and thickened by the pressure of a large tumour.

CASE V.—On the 24th of last June I was asked by Dr. L. Deal to see Mrs. J. W. F., who had an ovarian cyst. Dr. Deal had been left in charge by the family physician, who had gone out of town after tapping her. This operation caused an inflammation of the cyst wall, and very formidable septic symptoms had set in. I found her with a pulse of 132, and a very high temperature; with sunken eyes and blue circles around them; with clammy sweats, with such great prostration that she could hardly articulate, and with all the characteristic symptoms of an advanced stage of septicæmia.

There was but one remedy to save life, and that the desperate one of removing the cyst from a person so enfeebled by disease as to make her death on the operating table quite probable. Dr. Deal and I weighed all the arguments pro and con, and decided in favour of the operation. All its dangers were pointed out to the sufferer and to her family. She cheerfully accepted them, saying that if she died she would at least have the satisfaction of knowing that she died without a tumour.

On June 26th, Drs. L. Deal, A. K. Minnich, M. A. Wood, and B. F. Baer aided me in the operation. She had passed a bad night, and looked so desperately ill that my courage almost failed me. Upon opening the abdominal wall, to my great dismay I found the cyst firmly bound to it everywhere. As fast as these adhesions were broken, others turned up, binding the cyst to the viscera. There was not a point on the cyst, not even on its stalk, which was unattached. The pelvic and parietal peritoneum, the bladder, the liver, the intestines, and the omentum were firmly united to it. Many of these adhesion bands were too firm to be broken by the finger. Several patches of the adherent cyst were cut out and left behind. For these purposes I found Thomas's spoon-saw to answer admirably. The right ovary was the one involved; it was a monocyst containing a bucketful of purulent fluid. The walls were thick, but they had become so much softened by inflammatory changes as to tear like blotting-paper. These rents caused the unavoidable escape of some of the fluid into the cavity of the abdomen. At last the pedicle was reached, and that too was found bound down by adhesions. It was freed, transfixed, and tied. Very little oozing took place, and only two or three vessels needed the ligature. A glass drainage tube was put in, and the wound was closed in the usual manner and dressed with salicylized cotton.

During the operation the woman's condition looked very perilous. Once I thought she would die on the table. After she had been removed to her bed, her pulse was so feeble and the shock so great that we did not expect to see her rally. Hypodermic injections of pure ether in the gluteal region brought her pulse up a little, but she was so low when I left the house, that I had no idea she would live through the night.

Having heard nothing of the case, and firmly believing that the woman was dead, I was much astonished to receive, on June 30th, a telegraphic summons to see her. I reached her bedside early in the afternoon, but found her dying.

From Dr. Deal, who had most skilfully managed the case, I learned that on the morning following the operation, our patient seemed better than she had been for many days. By evening her pulse had fallen below 100, and her temperature to 99.5°. On the third day both pulse and body heat ran up a little, but intra-peritoneal injections of carbolized water

brought them down. She now appeared so well and so bright, that both Dr. Deal and the woman's family were very hopeful. But, early on the fourth day, an uncontrollable diarrhoea set in which rapidly weakened her.

Having had three successful cases in succession, I was naturally anxious to keep up my average, and I must confess to having been very reluctant to interfere in this case. She was so feeble and so ill from blood-poisoning as to make the end seem almost a foregone conclusion, and I operated simply from a strict sense of duty. Yet in spite of the fatal issue, so sure am I that I was right, that under the same circumstances I shall act in the same way. At any rate it is the opinion of all the gentlemen present, that the removal of the purulent cyst prolonged her life, and I believe that she would have lived had not the adhesions proved so formidable.

From these cases it will be seen that Lister's antiseptic method was adopted, with the exception of his dressing. I tried his dressing in the first case of this series, but I was not pleased with it. It is too stiff and bulky. Withal, it must be freshly prepared, and to do this needs time and skill. I therefore decided to try an absorbent and antiseptic cotton wool, which could be readily made at any time, and, with that view, I hit upon salicylicized cotton. It is prepared by steeping absorbent cotton in a hot one per cent. solution of salicylic acid. When thoroughly saturated, the cotton is gently squeezed and dried. After the sutures are twisted, a thick and wide pad of this antiseptic cotton is laid on the wound and gently pressed in between the wires. Long strips of adhesive plaster keep the cotton in place, and over all is pinned a fine white flannel binder.

This dressing seems to me to be the simplest and the best, for, apart from its being a dry one—which to my mind is no mean advantage—the pressure secured by the elasticity of the cotton and by that of the flannel binder, brings the parietal peritoneum in firm contact with the bowels. It thus will often check those stubborn oozings which resist all local staunching. The pressure can be increased and made more efficient by bags of shot laid on the abdomen. In such cases I should always use a glass-drainage tube, not only for future intra-peritoneal irrigations if they should become needful, but for the purpose of removing by a long nozzled syringe the bloody fluid which may have collected in Douglas's pouch during the time spent in closing and dressing the wound. The tube also acts as a gauge to indicate whether the oozing has stopped or not.

Codman and Shurtleff's atomizer was the one used, and I can bear witness to its efficiency. It holds water enough for the longest operations, and has the further merit of being supported by a stand, thus dispensing with one assistant and with unsteady hands. Its bulk is its only drawback, and that is a serious one when the operation has to be performed in the country or at the patient's own home.

It will be noted that, in all these cases, the stalk was treated by the intra-peritoneal method—in other words, it was tied and dropped back into

the abdominal cavity. Fine silk was used in preference to gut, because the latter, from slipping, from untying, and from being too short-lived, is a treacherous ligature. Nor does the silk act as a foreign body. It is disintegrated by the growth of lymph cells in its meshes, and, being an animal substance, is absorbed like gut, but by no means so soon. Since the introduction of antiseptic surgery, this mode of treating the stalk has gained many adherents, and it bids fair before long to usurp the place of the clamp. The conscientious researches of Thornton<sup>1</sup> and of Bantock<sup>2</sup> will do much towards effecting such a change of opinion.

The arguments for and against the clamp and the ligature may be summarized as follows:—

The clamp, by delaying the sealing up of the wound, hinders the main object of antiseptic surgery—the exclusion of poison germs. Sometimes the slough caused by the clamp creeps down the stalk and conveys putrilage into the abdominal cavity. The stalk always becomes united to the abdominal wall, and thus, when short, drags painfully upon the womb. Since the portion compressed by the clamp invariably sloughs off, the oviduct in one-third of the cases remains open, and menstrual fluid will escape for an indefinite period of time from the abdominal cicatrix, making it raw and sore. In my very first case of ovariectomy the pedicle was thus treated, and the oviduct remained open. After two years the fistulous cicatrix became the site of a large vegetating cancerous growth. Six months later it was removed by my friend Dr. W. Hunt, but fatal peritonitis set in.

The intra-peritoneal method fulfils all the requirements of antiseptic surgery, but the objections urged against it are at first blush very plausible. The first one is that the distal end of the stalk is liable to slough off and leave putrilage in the peritoneal cavity. That this is unfounded is proved by the investigations of Drs. Thornton and Bantock. Sloughing rarely happens, because the shrinkage of the stalk so far loosens the ligature as to permit the return of capillary circulation. Then again, the peritoneal banks of the narrow and deep gutter made by the fine silk will bulge over and span the gap. Adhesion takes place between the two, and the blood-vessels, which shoot over from the proximal side of the ligature, will carry life into the distal end. Or, lymph exuded by the irritation of the ligature will throw a living bridge over the gutter. Or, what is least desirable, the raw end of the stalk glues itself to any peritoneal surface with which it lies in contact.

Another objection urged against this method is that, since menstruation is liable to take place from the abdominal cicatrix, *a fortiori* will the same phenomenon take place from the stump when lying within the peritoneal cavity. But this is not so, for when the clamp is used the compressed and

<sup>1</sup> British Medical Journal, January 26, 1878, p. 125, and October 19, p. 594.

<sup>2</sup> Ibid. May 24, 1879, p. 769.



the distal portion of the oviduct sloughs off, leaving an open tube below. When, on the other hand, the ligature is used, neither the distal nor the compressed portion of the oviduct sloughs away, but they both degenerate into a firm but living plug of cicatricial tissue. The only valid objection to the intra-peritoneal method is the liability of the raw end of the stump to unite itself to a loop of intestine and cause obstruction. This, however, can be avoided, either by stitching the end of the stalk to the broad ligament, as Thornton recommends, or by catching it up by the lowest abdominal stitch, after Bantock, or by resorting to a plan suggested by Lister, and, as far as I can find out, first carried out by myself in Case II., viz., the doubling in of the cut edges of the stalk, and the stitching of them together by fine gut.

In conclusion, while I do not advance my own limited experience, the wonderful results of English ovariologists and the improved statistics of Continental surgeons prove to my mind that antiseptic ovariectomy has won the day, and that he who does not resort to it withholds from his patients a great safeguard against the most common perils of this operation.

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#### ARTICLE IV.

TREATMENT OF PERTUSSIS BY INHALATION. By J. LEWIS SMITH, M.D.,  
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College, New York.

DURING last April and May several cases of whooping-cough were received in the quarantine wards of the New York Foundling Asylum, and as treatment by the remedies which are in common use, as belladonna, quinia, and the bromides, had not been as successful in former cases as was desired, we concluded to make trial of inhalations. The spray of the following mixture was inhaled from the steam atomizer, three times daily, and from two to five minutes at each sitting.

R.—Acid carbolic, ℥ss.  
Potas. chlorat. ℥ij.  
Glycerinæ, ℥ij.  
Aquæ, ℥vj. Misce.

This treatment commenced about the middle of April, when Dr. J. B. Reynolds was on duty, was continued through May, when I was serving. About twelve cases were thus treated, too small a number, though the result was uniform, to enable us to decide positively as to the utility of the spray. Nevertheless the effect was such as to justify its further trial, and encourage the belief that the atomizer will be found a very useful adjunct to the measures employed, if not more effectual than any other single remedy. The cases were, I think, somewhat milder than the average,

for they occurred in the declining period of an epidemic; still with some of them the spasmodic cough was severe before the instrument was used. The following brief records of seven of these cases will enable the reader to judge for himself of the effect of this treatment.

CASE I.—Daniel, aged 4 years; his condition was first observed and recorded on April 11th, when he had fully developed pertussis. April 12th. Whooped nine times during day and night. 13th. Whooped ten times. The spray was now employed, and there was only one spasmodic cough during the next twenty-four hours. The improvement continued with the use, three times daily, of the atomizer, but the records were not preserved till May 1st, after which they were as follows as regards the cough.

May	1	2	3	4	5	6	7	8	9	10	11
Times of spasmodic cough	2	3	0	1	0	0	0	1	0	0	1

After May 11th the cough was considered cured.

CASE II.—Mary, aged 5 years, was admitted into the quarantine wards on April 15th, the characteristic cough having been first observed on this day. She had severe bronchitis, which was treated on the 16th and 17th. On the 18th, day and night, the paroxysms occurred ten times. The atomizer was then employed three times daily, and the number of daily paroxysms was reduced to at least four, and on some days to one or two, till May 1st, when the number of coughs reached six. The treatment by the spray was continued with the following result:—

May	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Times of spasmodic cough	6	3	0	2	1	0	0	1	0	0	1	1	1	0

CASE III.—John, aged 4 years, whooped for the first time on April 20; and on April 21, day and night, whooped seven times. The spray was now employed, at first about two minutes each time, and afterwards five minutes. The record of the cough, commencing May 1st, was as follows:—

May	1	2	3	4	5	6	7	8	9	10	11	12
Times of spasmodic cough	6	10	5	3	1	0	0	2	0	0	1	1

CASE IV.—Jasper, aged  $2\frac{1}{2}$  years, began to whoop April 24th. On April 25th he whooped four times, and on the 26th seven times. The spray was now used, and the cough was so controlled that, after May 1st, it was no longer spasmodic. A daily record being made till May 17th.

CASE V.—Isabella, was admitted May 2d, in the commencement of the spasmodic stage. The cough was severe, producing much congestion of the face. There were nine paroxysms in twenty-four hours. The spray was now used three times daily with the following result:—

May	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Spasmodic cough	8	2	0	1	1	1	2	1	1	3	4	4	2	3	3	3	1	0	2

After May 28th the spasmodic character of the cough was lost.

CASE VI.—Norma, aged 10 months, began to have the spasmodic cough May 10th. The spray was used without the chlorate of potassium three times daily till May 29th. During the twelve days, ending with May 29th, the paroxysms averaged about six daily. On the 29th the spray containing the chlorate of potassium was employed with the following result as regards the cough:—

May	29	30	31	June 1	2	3	4	5
Times of spasmodic cough	6	4	6	3	2	0	0	0

CASE VII.—Maggie, aged 8 months, first had the spasmodic cough about May 10th. The paroxysms numbered six or eight daily till May 14. On the 14th treatment by the spray was begun, after which the paroxysmal cough was as follows:—

May	15	16	17	18	19	20	21	22	23	24	25	26	27
Times of spasmodic cough	3	4	7	4	5	6	7	8	5	6	6	5	5
May	29				30	31	June	1	2	3	4		
Times of spasmodic cough	4				3	4		2	2	0	0		

In the remaining cases, the histories of which were not so fully recorded, the result was nearly, if not equally good, a result better as regards mitigation of the cough than has been obtained in my practice from the use of any other single remedy.

The chief danger in this disease is in the period of spasmodic cough, and is usually proportionate to the severity of the cough. If the cough is mild, complications, as convulsions, atelectasis, pneumonia, etc., are not apt to occur. Hence the physician very properly endeavours to ameliorate the cough, knowing that in proportion as it becomes mild the prognosis improves, the cough can no doubt be rendered milder and less frequent by a considerable number of medicines, chiefly such as diminish “reflex irritability” and procure sleep. Hence there is a long list of remedies which have been recommended for the cough by physicians of experience. In the Index of Therapeutics, appended to Stillé’s and Maisch’s *National Dispensatory*, thirty drugs are named which are supposed to be useful in whooping-cough. Agents to diminish the frequency and severity of the cough, the bromides to prevent convulsions, quinia to reduce fever, and support strength, when the bronchial catarrh has extended so as to become a complication, or pneumonia has arisen, the timely use of opium and bismuth, to check intestinal catarrh, and the more general use of stimulants, have in recent years greatly reduced the mortality from pertussis. Therefore cases now have a favourable issue, which, with the different treatment of former times, would inevitably perish. From having been one of the most fatal maladies, fifty years ago, so that in New York one died from whooping-cough in every 76 deaths from all causes, it is now less fatal than almost any other severe contagious malady.

Still most of those remedies, which are in common use, fail to produce that beneficial effect, in certain cases, which we desire and the friends expect, and which results from their use in other cases of pertussis. Belladonna, now so commonly employed, benefits a considerable number of patients, when given in medicinal doses, while there are others, and not, I think, a small minority, in whom its beneficial action is not appreciable. I say in medicinal doses, for most of us hesitate to follow the advice of Brown-Sequard to give belladonna, or rather its active principle, in a dose so large as to produce toxical effects, even delirium, and repeat it as the symptoms abate, so as to keep up this effect for three days, after which, according to him, the cough is no longer spasmodic.

It is obvious that if a spray can be inhaled with perfect safety, which controls the paroxysms, thus enabling us to dispense with the use of active internal agents, except as special indications arise, an important gain will be achieved in the treatment of pertussis; and result of the above treatment encourages the belief that inhalations will yet be more generally used to ameliorate the cough, either that which has apparently been so successful in the Foundling Asylum, or one which experience has shown to be better.

There appears to be an exaggerated sensitiveness of the laryngeal filaments of the pneumogastric in this malady, so that inspiration of air, as in crying or laughing, or a current of cold air passing over the laryngeal surface, or the lodgment of mucus upon it immediately excites the cough, notwithstanding the efforts of the patient to repress it. Belladonna probably does good by diminishing the reflex irritability, and the hypersensitiveness of the surface of the larynx.

The good effect of the spray in the above cases seems to me to have been largely due to the carbolic acid, which, when used locally, is known to produce an anæsthetic effect on mucous surfaces, but in one or two instances in which the chlorate was temporarily omitted from the mixture, patients seemed to do better with than without it.

In looking over recent medical literature, to ascertain whether the vapour of carbolic acid, which is not in the long list given by Stillé and Maisch, has been recommended for whooping-cough, I find attention called to it in a paper published by Dr. Seemon in a St. Petersburg journal, an abstract of which appeared in the *Monthly Abstract of Medical Science* for June, Dr. S. recommends that a 5 per cent. solution of the acid be inhaled from woollen material saturated with it and hung around the bed. This mode of its use, I presume, is less effectual than its employment by the atomizer, while it is more disagreeable to attendants.

But however desirable it may be to ameliorate the cough, sustaining measures are required in most cases during the spasmodic stage and in convalescence. I have found beef, wine and iron, as now prepared by pharmacutists, very useful for these patients, given in teaspoonful doses, every two hours, to a child of two years.

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#### ARTICLE V.

HOW LONG MAY A FŒTUS LIVE IN UTERO AFTER THE DEATH OF ITS MOTHER?

By ROBERT P. HARRIS, A.M., M.D., of Philadelphia.

IN view of the possibilities of saving alive the children of women who have died in advanced pregnancy, this question is one of considerable importance. We may suppose ourselves in attendance upon a patient who

has been killed, has died suddenly by disease, or has perished after a lingering illness; she has been pregnant seven, eight, or nearly nine months. What is the prospect of saving her child by an immediate delivery under the knife, or *per vias naturales*?

Again, we do not see her, perhaps, until she has been dead fifteen minutes, half an hour, an hour, two hours, or more. Is there any use in opening her body in the hope of finding the fœtus alive? Can we put any faith in the cases of remarkably prolonged preservation of life in the uteri of dead women; such as have from time to time appeared in old books and journals, the reports claiming the removal of living children after eighteen, twenty-four, and even forty-eight hours?

This subject has been brought to my mind more particularly of late by the receipt of an old Peruvian record, kindly translated for and sent to me by Dr. W. S. W. Ruschenberger, U. S. N., President of the College of Physicians, Philadelphia, which gives an account of one of those marvellous *post-mortem* deliveries of living children, such as the medical world has been time and again called upon to believe, doubt, or entirely discredit, according to the measure of credulity in the reader. The case is an obstetrical curiosity, having in its details the appearance of truth, as such records frequently present; but requiring a large measure of faith to believe in the possibility of its occurrence. The manner of death, by lightning, although marking decidedly the time of dissolution, renders the case still more doubtful, and places it in the list of those commonly regarded as fabulous by all who are not made credulous by ignorance or superstition. The Peruvian statement is as follows:—

“TUCUMAN,<sup>1</sup> January 8, 1795.

“On the 18th of December last (1794), at about half-past five o'clock in the afternoon, a thunderbolt killed a Samba woman who was in the last months of pregnancy. It entered at the middle of her crown, passed out at the right side, and superficially over the rest of her body to the knee. The next day, the 19th, with the consent of the Curate Vicar of this city, Don Joseph Ignacio James, the chief Alcade, Don Pedro Gregorio Lopez, ordered the Cæsarean operation to be performed, in spite of the unwillingness and formal opposition of the relatives of the deceased; and notwithstanding that her head was already fetid, at half-past eleven o'clock A. M., Don Antonio Terri happily performed it in the presence of the Alcade, the Vicar, and other gentlemen who cheerfully concurred in the operation. It was done so felicitously that the fœtus was still alive. It was a boy, and lived a quarter of an hour after it was baptized. There is no doubt that the infant would have lived had the operation been performed immediately after the accident; but the mourners of the deceased preserved a destructive silence, although they observed that the infant was constantly moving in the abdomen. This case proves the importance of the operation, and we should exercise vigilance over people who are heedless on a point so important to the safety of soul and body.” (*Mercurio Peruano*, p. iii. tomo xii., Lima, 1795.)

Had this case occurred in Great Britain, or the United States, where it could have been reliably attested, or had any of the parallel cases in history been free from all suspicious circumstances, we might be prepared

<sup>1</sup> In Laplata, about 1300 miles southeast of Lima.

to believe them; but although there have been many such cases more or less imperfectly recorded, there is not one that is free from the suspicion of being in some measure a fabrication. The death of the woman by lightning, the continuance of muscular activity in the fœtus long after her death, and the escape of the child from being either killed or stunned, give an air of impossibility to the whole story. Although it is not correct, as we are sometimes told, that the blood after death by lightning is usually found fluid, that decomposition commences unusually early, or that there is generally no *rigor mortis*, still the manner of death, and its effect upon the mother, would not favour a prolonged maintenance of an independent existence on the part of the fœtus.

Although, as a general rule, the uterus is the last of all the viscera to show signs of decomposition after death, there is a limit to its power of sustaining life in the fœtus, when its sinuses no longer receive oxygenated blood, purified in the lungs of the mother and circulated by the action of her heart. The child in utero is said "to make and circulate its own blood;" which is true in a very dependent sense, the mother furnishing the elements of nutrition and purification, and at the same time eliminating effete and poisonous matters, such as urea, carbonic acid, etc.

If we place a sparrow, as in the experiment of Bernard, of Paris,—which I saw tried by him,—in a three-gallon bell-glass over a dish of mercury, so as to exclude the air, and compel it to breathe that confined within until it has become poisonous by vitiation, we will find at the end of three hours that the bird is still quite active and apparently in health. Now introduce a second sparrow under the bell-glass, and it dies immediately; set the first bird at liberty, and the inhalation of a pure air in its partially asphyxiated state will kill it in a second or two.

The fœtus in the uterus of the dead mother is in a measure poisoned by the impurities in its own blood, like the first sparrow under the bell-glass. It lives on the elements left in the uterine sinuses and in its own blood, until these are exhausted; its blood is no longer purified, and it finally dies sooner or later, as if drowned. Remove the fœtus immediately, and it will in many instances live; put off the delivery a short time, and although the child may be alive, it will generally, after a gasp or two, cease to breathe. Artificial respiration if persevered in, in some cases requiring an hour or more, may prevent death; but unassisted, the fœtus is rarely found on delivery to be in a condition to maintain its existence by the respiratory act.

Theoretically, the manner of death in the mother should have a very decided influence upon the duration of life in the fœtus; and, as a general rule, this proves to be correct also practically; but there are on record many notable exceptions, which it is impossible to account for. *Viability* in these cases is a relative term, having certain rules which are liable at times to be most unaccountably broken. A viable fœtus, obstetrically

considered, should have a measure of vitality, greater or less according to its intra-uterine age and development; but there are to be found some very remarkable exceptions. In lingering and exhausting diseases, the death of the child often, and perhaps in the majority of cases, precedes that of the mother; but the former has been rescued after phthisis ending in hæmoptysis, granular degeneration of the kidneys, and in one or two instances even after Asiatic cholera, which was at one time contended to be uniformly fatal to both, if the mother perished. Sudden death in the midst of full health, as from an accident or a violent apoplexy, produces usually the most favourable cases for saving the child by a prompt delivery.

Uræmic eclampsia, although arising from a poisonous condition of the blood, and necessarily in many cases dangerous to the life of the child, is found in practice to be much less fatal, than we would from its character be led to suppose. Quite a number of infants have been delivered alive and saved, where the mothers have died in convulsions, undoubtedly of a uræmic character. We should naturally suppose that the fœtus would be destroyed during the spasmodic movements of the patient; or perish from uræmic poisoning; but it has in quite a number of instances escaped.

Promptness of action is highly important, and the nearer the delivery is to *immediate*, as relates to the time after death, the better will be the prospect for success, although a very large proportion, even of those operated on within five or ten minutes after the decease of the mother will prove to be failures. The child no doubt often perishes, while the accoucheur is determining whether or not the woman is dead; or is persuading the relatives to permit him to open the body.

There are reasons for believing that, under some peculiar and exceptional circumstances, the life of the infant is sometimes prolonged in the uterus of a dead woman, for one, or even as long as two hours; but beyond this, I am not prepared to go, without much better proof than has been given, in the marvellous records of the past. Prolonged life in utero without oxygen, leads us to infer that it must be sustained by some obscure influence, allied to that in the complete hibernation of some of the lower animals, in the state of trance in the human subject, and in cases of prolonged syncope resembling death, in which the functions of the body appear for the time to cease, although the subject is alive, and may be restored to wonted health.

Beyond the limit of two hours, we may find the records of cases claiming life after delivery, when the mother has been dead "several hours," "twenty-four hours," "forty-eight hours," and even beyond this. If a fœtus lives after it has ceased to receive oxygen, it must soon reach the condition in which we find some apparently still-born children; that is, in a perfectly quiescent state. As such have been restored by operations commenced as late, "by the watch," as an hour after delivery, there is reason to believe that life may be prolonged in utero, without proper arterialization, for an analogous period. But while admitting this, I am

not prepared to credit the continuance of muscular activity in utero, when there can be no equivalent for the respiratory act. When we are told, as in the Peruvian report just given, that "the mourners of the deceased preserved a destructive silence, although they observed that the infant was constantly moving in the abdomen," we are at once compelled to doubt the whole story, in view of the fact that muscular movements have rarely been distinguishable beyond fifteen or twenty minutes after the death of the mother, and that artificial respiration is required in almost all cases, even where delivery has been accomplished by an early resort to the knife. In calculating the possibility of life within the uterus of a dead subject, we must be sure that death is an actual condition, and that we are not dealing with a case of suspended animation; for such have been operated on by the Cæsarean section, the child found alive, and the woman has either perished under the knife or has subsequently revived.

Dr. Blundell<sup>1</sup> relates an excellent typical case which came under his own observation in Guy's Hospital.

A woman far advanced in pregnancy, was run over by a stage which crushed her waist, and cut her liver in two parts, causing her death in a few minutes after she reached the hospital. In thirteen minutes after her last respiration, the abdominal section was commenced. In fifteen, the fœtus was out of the uterus, and subjected to restorative measures. Its lungs were inflated by means of the tracheal tube; the warm bath used, and artificial respiration persevered with. In thirteen minutes, the child began to breathe a little, and the umbilical cord to pulsate, and in time restoration was complete.

A careful examination of this whole subject has satisfied me that we can form no *reliable* estimate in any given case, of the prospect of saving the fœtus, from a consideration of the cause of death in the mother, or her previous medical history. All that we can be certain of, is the general rule, that some forms of death are on the whole favourable, and others unfavourable to success. Dr. Blundell<sup>2</sup> expresses the general belief of the profession, when he says: "If the death of the mother creeps on her gradually, whether from bleeding or other causes, the chance of saving the child by removing it from the body of the deceased parent is exceedingly small. But where the death of the mother occurs in consequence of apoplexy, or some sudden accident incident to the most vigorous health, the probability that the fœtus may survive the mother is much greater."

The question that most concerns us professionally, is the *ultimate* saving of the delivered fœtus. It can be of little satisfaction to us as physicians to remove an immature fœtus, or one for some reason in a non-viable state; have it gasp a few times and then die. "The child is entitled to its own life," and we are if possible to save it, without any special regard to the value of this life in a medico-legal, or it may be religious sense. The triumph of management is the entire restoration of the child, and placing it in a condition to continue to live if properly cared for. The other questions may be important in the eyes of the family, and a valuable aid to us in obtain-

<sup>1</sup> Obstetric Medicine, 1840, p. 473.

<sup>2</sup> Op. cit., p. 472.



ing consent to the operation for removal ; but our business and interest lie beyond these considerations, which give value to a few moments of life. We may save a child long enough to obtain the rite of baptism, or to establish a question of inheritance or succession, and lose it in the end, because having these considerations too much in view, we fail in the degree of perseverance required to secure a durability of existence. The first five minutes after the death of the mother, are often very important to the life of the child, if we expect to save it, and we cannot act too quickly, if the manner of death satisfies us that life is extinct and not suspended. The fear of operating on a still living woman, makes the accoucheur in some instances over-cautious, and causes him to wait until it is too late to save the fœtus. That many children have perished in utero in our country after the death of their mothers, because of their non-removal, there can be no doubt. I know that such have occurred in this city, and one well established instance, was a part of the experience of the late Professor Nathaniel Chapman of the University of Pennsylvania. A lady well-known in fashionable life in Philadelphia, and of plethoric habit, was taken in labour near her full term, the parturition being precipitated by an attack of cold from exposure. In the early stage of labour she suddenly died. Dr. Chapman demonstrated the fact of death to the family, and showed them by the motions of the fœtus, that it was still living. He begged for permission to open the body, that he might save the child, but was positively denied it, although the movements were kept up some fifteen or twenty minutes. A little of the old Roman law, of compulsion under severe penalty, would have been valuable in a case like this. Although not a punishable offence here, it was just as much a murder as the crime of producing abortion is in a healthy woman.

As the case of the Princess Pauline Von Schwartzenberg, of Austria, has been so often reported by obstetrical authors, from Prof. Gardien of Paris, only six years after the occurrence of the accident, down to Dr. W. S. Playfair, of London, in 1878, I have taken some trouble to get at the truth of the matter.

Prof. Claude M. Gardien says (1816) in the second edition of his work on obstetrics, "*All Paris knows*, that the unfortunate Princess Pauline de Schwartzenberg perished from the effect of burns received at a fête, given in the house of the Austrian ambassador, her brother-in-law ; she was pregnant, and the infant was found alive, although she was not opened until the day after the accident." He repeats the same words in his edition of 1824, although he says on the title page that the work has been "*reviewed and corrected*." Prof. Alf. A. L. M. Velpeau quotes the account from Gardien in his own work on obstetrics in 1829, and thus, step by step, the story, on apparently high authority in its beginning, has come down to our day, often doubted it is true, but not substantially contradicted.

History affirms that the Prince gave a grand ball in Paris, in honour of

the wedding of Napoleon Bonaparte and Maria Louisa, on Sunday night, July 1, 1810. In order to accommodate his guests, he had built a temporary ball-room in the garden of the hotel (Montesson) as an annex, and it was in it, that the fire took place. Soon after the dance began, a gauze curtain, at the end of the hall most remote from the door became ignited from a lamp, and in a few minutes the whole structure was in a blaze. All of the guests it is believed had, at one period, escaped, the Princess with her daughter among the last, although some had been seriously injured. The mother and child becoming separated in the confusion, the former fearing for the safety of the latter, in the excitement of the moment, rushed back into the blazing edifice, which, in part, fell in upon her, and she was burned up beyond recognition.

The question in which we are chiefly interested is, to what degree was the body burned? Was the Princess simply injured to an extent to produce death, or was the burning carried to such a degree that the escape of the fœtus was an absolute impossibility: for if the body can be shown on reliable authority, to have been destroyed in the fire, then the claim of success in the post-mortem Cæsarean operation fails, as there could have been no fit subject on which to perform it?

Alison,<sup>1</sup> on the authority of the two French historians, Bignon,<sup>2</sup> and Thibaudeau<sup>3</sup> says: "So fierce were the flames, that the place where the unfortunate Princess had perished, could only be discovered by a gold ornament she had worn on her arm, which resisted the conflagration."

Madame Junot,<sup>4</sup> wife of one of Napoleon's generals, and better known as the Duchesse D'Abrantes, writes very minutely of this disaster, getting her information through letters received in her absence from Paris, written soon after the occurrence. She corroborates the account of the destruction of the body, and says: "Her body, with the exception of her bosom, and part of one arm was burnt to a cinder." She also states that the Princess was only recognizable by a gold ornament, which she describes as a neck-chain and locket, instead of a bracelet.

Here we have four historical writers, all of whom state, that the body said to have been operated upon was burned to such a degree that a post-mortem Cæsarean section could never have been thought of. Had the burns been simply fatal, and the delivery effected as stated, and with the result claimed, the case would not have waited six years before it would have been reported. That there is no authoritative mention of so remarkable an operation in any of the medical journals of the period, and that Prof. Gardien quotes no authority, or gives any names connected with it, is rather strange, if it was ever performed. Certainly he, or Prof. Velpeau,

<sup>1</sup> History of Europe, from 1789 to 1815, vol. iii. p. 335.

<sup>2</sup> Hist. de France depuis le 18 Brumaire. Paris, 1829, xix. p. 159.

<sup>3</sup> Hist. de France pendant la Revolution et l'Empire. Paris, 1835, vol. viii. p. 128-129.

<sup>4</sup> Memoirs of Napoleon, his Court and Family, Am. edition, N. Y., 1862, p. 356.

would have named the operator, and given more of the points of the case, if any report had ever appeared. The expression, "*all Paris knows*," only applies to the accident; the punctuation, and want of the words *and that*, show that her condition, and the reputed operation, are not included in the general knowledge, as might appear on a casual examination of the original. There is, therefore, not even the authority of a city rumor for the operation and its result; it rests for credence simply on the word of the author, who in the previous sentence tells us, also without reference, of a woman who was assassinated by her husband with a knife, and who was delivered of a living child by the Cæsarean section forty-eight hours after death.

It is not to be presumed that these marvellous reports originated with Prof. Gardien; but it is unfortunate that he should have given them credence, and the value of his name, by the expression, "*Je citerai seulement deux faits*," as preliminary to the two statements. The chief mystery now is, what could have been the motive for fabricating the Schwartzenberg story?

Cæsarean rumors without the least foundation, claiming successful operations on the living, have not been uncommon in the world's history. There was one connected with the birth of Edward VI., son of Henry VIII. of England, in 1537, and I have had to put an end to several in our own country, two of them as long credited locally as the case before us. I am therefore quite incredulous when examining these old marvels, and inclined to look up a case *de novo*, rather than accept it in blind faith.

In view of the statements made, the language of Dr. J. H. Aveling, in a paper read before the Obstetrical Society of London in 1872,<sup>1</sup> sounds rather curiously, when he says, after citing a number of marvellous Cæsarean deliveries: "But perhaps the most extraordinary and best authenticated case is that of the Princess of Schwartzenberg, whose death occurred in Paris in 1810." If his deduction No. 6,—which reads, "after the death of its mother, a child may continue to live in the uterus for many hours,"—has no better foundation than this, I must adhere to the opinion that as yet we have no *reliable* proof of the existence of fœtal life in the uterus of a dead woman, beyond two hours: the case may not be impossible, but it is *not proven*.

It is somewhat strange that there should have been at a remote period so many cases in proof of prolonged fœtal independence in utero, when there is not one instance in this day of incredulity and more rigid investigation. As teratological wonders repeat themselves in kind, after longer or shorter intervals according to their rarity; so these marvels, if ever genuine, must re-occur at some future day, when they can be attested beyond dispute. Until then, we must hold to the opinion already expressed,

<sup>1</sup> Post-mortem Parturition, Trans. Obstet. Soc. Lond., vol. xvi. 1873, p. 253.

the limit admitted being itself one of extreme rarity. By experiments on the lower animals it has been ascertained that a state of asphyxia sets in soon after the mother is killed, and becomes completely established in a few minutes. In the larger mammalia, as the cow, the fœtus has been found alive as late as three-quarters of an hour after accidental death in the mother.

In the human subject, as ascertained from hundreds of post-mortem Cæsarean operations, not one in five infants shows any signs of life when the uterus is opened, and not one in ten lives to be delivered. This is a liberal allowance, when we consider the numbers of cases that have never been reported. The proportion eventually saved is very small, and has not been satisfactorily ascertained.

From private sources of information, I have reason to believe that post-mortem deliveries are much more common in the United States than would appear from published reports; but the practice is much more infrequent than the importance of the operation demands. I believe, also, that we have as yet a very imperfect knowledge of the value and capabilities of resuscitative measures long persevered in, as a means of saving the life of the child. This is made evident by the marvellous results in a few reported cases, where the physician continued his efforts with commendable tenacity, and was rewarded by entire success, when many would have thought his perseverance useless, and advised a discontinuance.

I have purposely avoided in this paper the introduction of tabular statements, extracts of cases, and such other evidences of research, except the few special examples given, as these interruptions only mar the continuity of the text, and detract from its practical character. For this reason my chief points have been made rather deductive than evidential, after having carefully examined the literature of the subject. Those desirous of investigating the matter more critically, and upon points relating to the delivery of the fœtus and its resuscitation, are referred to the paper of Dr. Edward L. Duer, of this city, on "Post-mortem Delivery," in the Jan. number, 1879, of the *Am. Jour. of Obstetrics*; in which will be found a statistical table, and numerous bibliographical references. Dr. Aveling's article before referred to, will also furnish a list of cases, which may be of interest to the searcher after the curious and improbable, in post-mortem obstetrics. Dr. C. Garezky, of St. Petersburg, has made a collection of 379 post-mortem deliveries, and has published his observations in the *Wiener med. Wochen.*, No. 22, 1879. The paper is noticed in the *British Med. Jour.* for June 14th, 1879.

No doubt it would be some satisfaction to know just how many women have been delivered after their death, in the last two or three centuries; what proportion of children extracted alive; and how many of them finally saved: but this would not determine the probabilities and possibilities of the future. The statistics of the past are based upon work often tardily

and imperfectly done; and for this reason, are necessarily very discouraging in their results. We are to endeavour to save life, and to do all that we can with this view; feeling that the result, although very uncertain, is most frequently a failure; that success is determined by no positive rule, and that the most important measure is *haste*. In fact there is not a minute to be lost, and every moment is precious; the fœtus is like one drowning: it wants oxygen, and this must be supplied as soon as possible. Is the woman dead? then we cannot be in too much of a hurry to deliver the fœtus. Is there any possibility of its being found alive? then we must persevere in our resuscitative efforts until we either restore the child, or are convinced that it is beyond hope. If called in late, open the body, and make sure that the case is, or is not, one of prolonged intra-uterine independence. If there is any possibility of truth in the claims of historical cases, let us test it.

713 LOCUST STREET, Aug. 7, 1879.

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#### ARTICLE VI.

ON CONTUSIONS OF THE CRANIAL BONES. By JOHN A. LIDELL, A.M., M.D., of New York. late Surgeon of Bellevue Hospital, Inspector of the Medical and Hospital Department of the Army of the Potomac, etc. etc.

CONTUSIONS of the osseous tissue are essentially quite analogous to corresponding injuries of the integument or any other soft structure of the body. But, while the bruises of different tissues resemble each other much in general outline, they also differ considerably in important particulars. Thus, in respect to causation, the application of a much greater degree of force is required in order to contuse the hard osseous formations, than that which suffices to contuse the soft structures which invest them externally on the one hand, or are invested by them on the other. The integuments of the head are often severely bruised while the underlying bone escapes all injury. This difference obviously results from the greater solidity and strength of the osseous when compared to that of the soft structures in general. Again, in respect to phenomena, contusion of bone is by no means so constantly attended with ecchymosis as is contusion of the soft parts. Indeed, we but seldom if ever meet with an interstitial extravasation of blood sufficiently copious to constitute what is termed ecchymosis of bone in cases where the osseous tissue is contused, unless the structure is porous or cancellated, as it is in the spongy epiphyses of the long bones, in the short bones, etc. It is probable that ecchymosis does not occur in the compact structure of bone when bruised, because the medullary spaces in that structure are not large enough to hold a sufficient quantity of

extravasated blood to produce the characteristic discoloration. But when the cancellous structure of bone happens to get bruised, ecchymosis not unfrequently appears. The writer published two examples thereof in the number of this Journal for July, 1865, pp. 20-23. With regard to consequences, we find in cases of contusion of bone, especially when the compact structure is involved, that the vitality of the bruised osseous tissue is not unfrequently destroyed outright by the contusing force. Such a result is but seldom produced by contusions of the soft parts, excepting those rare instances wherein the integuments are badly bruised by large fragments of exploding shells, or by the impact of cannon balls whose force is almost spent, and those other cases wherein a thin layer of tissue surrounding the track of musket balls is killed by the stroke of these missiles. Moreover, contusions of bone generally prove much more troublesome in their management, tedious in their course, and fatal in their results, than contusions of soft parts. Of 13 cases of this form of injury, involving several different bones, which have been reported by the writer, 5 died and 8 more or less completely recovered. Of those who died, 3 had simple and 2 suppurative osteo-myelitis; in one of the latter mephitic gangrene of bone occurred just before dissolution. In all of them the osseous tissue was inflamed. In all of them death resulted from exhaustion; one of them, however, had well-marked pyæmia, and at the autopsy secondary abscesses were found in the lungs, spleen, and kidneys, but not in the liver. Of those who recovered, 1 had to undergo amputation of the thigh in order to save his life, 1 suffered necrosis of the tibia with exfoliation of nearly all its shaft, and a majority of the remaining 6 cases had painful, protracted, and exhausting suppuration, with exfoliation of dead bone, and considerable constitutional disturbance of a threatening character. Of the 13 cases of contusion of bone referred to above, the femur was the seat of injury in 6, the tibia in 4, the fibula in 1, the ilium in 1, and the parietal in 1 instance. Of those who died, the femur was the bruised bone in 4 instances, and the fibula in 1 instance. In 11 of the 13 cases, the injury was sustained by a long bone, and in each of the 5 fatal cases it was a long bone also that was injured.

The foregoing summary clearly shows how troublesome and dangerous to life contusions of the long bones of the lower extremities have proved to be; but it is probable that contusions of the cranial bones are more dangerous still, although the instance of the parietal mentioned above terminated in recovery, since the organs contained within the cranium are of much greater importance in the economy of life than those which are placed in relation with the long bones of the extremities. We next proceed to the special consideration of contusions of the bones which enter into the formation of the skull.

And firstly, in order to show the relative importance of this traumatic lesion of the head, we may state that the Army Medical Museum at

Washington contains 246 osteological specimens of gunshot injury of the head, and that included among them "are 22 specimens of gunshot contusion of the cranium" (*Circular No. 6*, p. 10). The examples of contusion constitute about one-eleventh part of the whole number. On referring to the published catalogue of this museum we find that most of these specimens of cranial contusion were obtained from cases which proved fatal. Some of them, however, consist of exfoliations of dead bone obtained from cases that terminated in recovery. Moreover, 328 cases of gunshot contusions of the cranial bones are reported in the *Medical and Surgical History of the War of the Rebellion*, and concerning them it may be stated as a near approximation to truth, that 55, or 17 per centum, died, 98, or 30 per centum, were permanently disabled, and 175, or 53 per centum, recovered (Part First, vol. ii. p. 128). We must therefore consider contusions of the cranial bones as injuries of frequent occurrence and dangerous character in military practice. But this kind of injury also occurs not unfrequently in civil life. Thus, Mr. Prescott Hewett states that "specimens of extensive disease, limited to the outer parts of the calvaria, and caused by a simple blow, exist in the museums of the Royal College of Surgeons and of St. George's Hospital." He also refers to a case mentioned by Dr. Abercrombie in which the inner table alone was thus extensively destroyed; likewise to Norris's case, in which "the disease attacked both tables of the whole of the calvaria, and extended even as far as the foramen magnum;" to Drummond's case, as affording "another example of extensive destruction of the vault of the skull, originating in a blow on the head;" and to Saviard's case as the most extraordinary example of the kind on record, since, "two years after a blow on the head, the whole skullcap came bodily away." The same writer also mentions an extraordinary specimen of hypertrophy of the skull resulting from contusion, which is contained in the museum of the Royal College of Surgeons, and says: "In the vault of this skull the bones are in some parts no less than eleven lines in thickness" (Holmes's *System of Surgery*, vol. ii. pp. 248, 249, 2d ed.). Mr. Pott relates a considerable number of cases of contusion of the skull produced by various casualties to which man is exposed in civil life, that had come under his own observation (*Chirurgical Works*, vol. i. pp. 49-107). Our Army Medical Museum contains a specimen that is classified under the head of injuries not caused by gunshot, and consists of "the vault of the cranium from an epileptic subject, showing necrosis in the right frontal eminence, the evident result of an old injury. The necrosed fragment, of the size of a small bean, is not detached, but the line of demarcation is well marked on both tables. Traces of ostitis, really incipient caries, are apparent for an inch around the central portion" (*Catalogue of U. S. Army Medical Museum*, p. 36, Specimen No. 2230). Besides the foregoing, several examples of contusion of the cranial bones not produced by gunshot will either be related or referred to in the fol-

lowing pages. Moreover, most surgeons of experience have doubtless met with cases in which a blow on the head, unattended with fracture, has been followed by exfoliation of the injured part of the skull, or by suppuration of the diploë (suppurative osteo-myelitis), or by caries (ulcerating ostitis), or by some important pathological condition of the encephalon which had its origin in an inflammation of the bruised osseous tissue.<sup>1</sup>

*Causes.*—Among the more important of the accidents which produce contusion of the cranial bones, we may briefly enumerate the following, namely: The impact of small arms, projectiles, and fragments of shell against the cranial bones, under certain favouring circumstances, blows on the head inflicted with blunt instruments, falls on the head, falling bodies striking the head in their descent, and the kicks of animals against the same part. But, in whatever way the force may be applied to the head, it is necessary, in order for contusion of the osseous tissue to occur, that it should not be so great as to produce solution of continuity or fracture, but still so sudden and violent in its application as to greatly disturb the anatomical relations that naturally exist among the histological elements of which the bone is composed, through a limited space at the place of injury; in other words, the blow must be strong enough to produce a hurtful commotion with crushing or laceration of the bone-corpuscles, the canaliculi, the Haversian canals, the medullary tissue, and the minute bloodvessels belonging to the injured part. In cases where contusion of bone occurs, it is probable that interstitial extravasation of blood almost always occurs, but ecchymosis is not discernible by the unaided eye unless the structure is such that the medullary spaces possess some considerable size, as, for example, they do in the diploë of the cranium, in the spongy tissue of the short bones, and in the epiphyses of the long bones. Hence, the compact osseous structures may be severely bruised without presenting an ecchymosed appearance. In warfare, contusions of the cranial bones are, for the most part, produced by glancing bullets and by those whose force is almost spent. Sometimes, however, they are occasioned by grazing bullets. In cases belonging to the glancing and grazing classes, the missile, if composed of lead, is apt to leave behind it particles of that metal sticking in the bruised osseous tissue.

*Consequences of Contusions of the Cranial Bones.*—Most of these have already been hinted at, or cursorily mentioned. They pertain either to the injured part of the bone itself, or to the integuments which cover it, or to the structures which lie beneath it; for example, the dura mater, the arachnoid, and the brain-substance. For the purposes of study and description they may be conveniently arranged under the following heads:—

<sup>1</sup> The experience gathered by our army surgeons during the late war of the Rebellion has added very much to our knowledge of cranial contusions. A free use of this experience, and of the important lessons which it conveys, will be made in the following pages.



1. The bruised portion of bone may be suddenly deprived of vitality at the moment of injury, *i. e.*, it may be killed outright by the blow, and thus *primary necrosis* may be produced.

2. Inflammation of a formative character may be excited in the elementary structures of which the injured bone is composed, and thus induration or eburnation and hypertrophy may result.

3. Inflammation of a suppurative character may be excited in the medullary tissue of the diploë, *i. e.*, suppurative osteo-myelitis of the bruised bone, and from this, pyæmia with secondary abscesses in the lungs, liver, etc., may spring; or thrombosis and pulmonary embolism may occur.

4. Inflammation of a destructive character may be excited in the bruised osseous tissue itself, and osteo-porosis, caries, and inflammatory necrosis may be extensively produced, with corresponding exfoliations of dead bone.

5. The inflammatory process may spread from the bruised bone to the dura mater and cause purulent matter to be deposited between that membrane and the bone; or it may spread still further to the arachnoid and the brain-substance, and thus kindle meningitis or encephalitis that quickly proves fatal.

6. Puffy swellings of the scalp, and sub-pericranial collections of purulent matter may form over the inflamed portions of bruised bone. Also, in the cases belonging to this category, erysipelas of the scalp sometimes supervenes.

7. Protracted inflammation of the contused pericranium, or osseous, or medullary tissues, sometimes follows, and in cases produced by gunshot, the wound may reopen at intervals and suppurate, yet no exfoliation take place. In such instances the patient usually has much pain in the injured part.

1. *Primary Necrosis*.—It happens, not unfrequently, in cases where the cranial bones are contused from the impact of musket balls and other small-arms projectiles, that necrosis or death of the bruised portion of bone is directly occasioned by the stroke of the projectile, without the intervention of the inflammatory or of any other pathological process whatever. In such cases the lesion of bone may, with propriety, be denominated primary necrosis, in order to distinguish it from the secondary forms of necrosis, which always have their origin in inflammatory action or in some pre-existent disease. The following case presents us with an excellent example of this important lesion. The writer watched its progress from day to day with lively interest.

CASE I. *Gunshot Wound of Scalp with Contusion of Right Parietal Bone, Inflicted by a Glancing Bullet; Primary Necrosis and Exfoliation of the Bruised Osseous Tissue; Recovery*.—Henry Abbott, Co. B, 32d Maine Volunteers, aged 21, was wounded in the head by a conoidal musket-shot at the battle of Tolopotomy Creek, Va., May 31, 1864, and

taken at once to the 2d division hospital of the Ninth Corps. On June 4, he was admitted to the Stanton Hospital, at Washington, under the writer's charge. The missile struck the scalp over the right parietal bone, passed downward and forward, making a furrowed wound of the scalp about three inches long and then escaped, denuding the bone and exposing the squamous suture in its course. On careful examination we found that the bone was not broken. It was neither fissured nor depressed. The patient's general condition was excellent. He did not exhibit any cerebral symptoms worth mentioning; bowels soluble. *Treatment*.—Quietude, ice-dressing for the wound, tinct. aconiti radiceis, gtt. ij, every three hours, and a spare diet.

*June 7.* He has diarrhœa with six or eight evacuations in twenty-four hours. Prescribed opium, gr.  $\frac{1}{2}$ ; tannin, gr. j; camphor, grs. ij; to be administered after each passage. In a short time the diarrhœa ceased, and his general health continued good. The wound suppurated and discharged laudable pus. It soon presented a florid, healthy appearance, from the formation of new granulation-tissue; but the portion of the skull exposed at its bottom was observed to remain bare and white, and apparently dead.

*July 12.* Removed a fragment of necrosed bone about one inch in length by half an inch in breadth. It embraced a part of the squamous suture, and consisted of the outer table and the diploë. It was not stained nor altered in structure by the inflammatory or any other pathological process. The wound was filled with healthy granulations, and the patient still had good health. Prescribed the warm water dressing for the wound in place of the ice-bag.

*14th.* Removed another fragment of necrosed bone about half an inch in length, and corresponding in appearance to that just mentioned. It consisted of the inner table.

*17th.* Health very good; wound almost healed.

*18th.* He left Stanton Hospital, having been transferred to the north.

*21st.* He entered Grant Hospital at Willett's Point, N. Y., whence he was returned to duty on Dec. 21, 1864. The recovery appears to have been complete, as the man's name does not appear on the list of applicants for pension.

This account of the case has been compiled from my own notes, and from the record of it which is given in the *Medical and Surgical History of the War*, at p. 122, vol. ii., Part First.

*Comments.*—It is worthy of remark that the external table of the skull was necrosed to a much greater extent than the internal table, in this case, and that if the necrosis had been occasioned by fracture, if the fragments of bone which in the end were cast off by exfoliation, had in the beginning been broken off by the impact of the projectile, and separated from the surrounding bone by fissure and depression, just the converse would have obtained; or, in other words, the internal table would have been destroyed to at least an equal, and probably to a much greater extent than the external table. Indeed, the physical properties of the cranium, its density, toughness, and elasticity, are such that in order for an islet of bone to become separated from the surrounding osseous tissue by fracture, it is necessary for it to be driven inward or depressed some distance, and

on the subsidence of the fracturing force, it does not rise up again to its original position or level. Moreover, it is obvious, that in order for depression of the skull in its whole thickness to take place in consequence of fracture, the hole in the internal table must be as large, at least, as the corresponding hole in the external table; and when we also consider that the inner table is more brittle than the outer, and that being situated on the internal arched surface of the skull on the side opposite to the place of impact, the fracturing force drives the external table into the skull and the internal table off from the skull, we must expect to find the internal table much more extensively broken than the external table, in all cases where the vault of the cranium is fractured with depression of an islet of bone.

To what cause, other than the direct action of the bullet on the bruised portion of the cranium, can the necrosis of both tables which occurred in this case be reasonably ascribed? We believe that it was not occasioned by fracture for reasons just given, and for the further reason that a most searching examination of the wound showed the continuity of the skull to be unbroken. We also believe that it was not occasioned by destruction of the pericranium and consequent denudation of the bone, because that lesion is for the most part not attended with the exfoliation of any dead osseous tissue whatever, and in the exceptional cases where it does occur, the exfoliated bone consists of thin lamellæ from the external table, but never of the whole thickness of the cranium. It was not produced by inflammation of the osseous tissue itself, nor by inflammation of the diploë, nor by inflammation of the dura mater, because the clinical history of the case clearly shows that destructive inflammation did not, at any time, exist in these parts. Hence, the conviction is forced upon us that the bruised part of the cranium was killed outright by the stroke of the bullet; and we are confirmed in this belief by the appearance which the exfoliations themselves presented when critically examined. They were white, clean, dry, not discoloured externally nor internally, not altered in structure externally nor internally, and looked exactly like broken fragments taken from the bleached cranium of an ordinary skeleton. The following example belongs to the same category as the above:—

CASE II.—John Yetter, private, Co. A, 11th N. J. Vols. aged 21, was wounded near Petersburg, Va., Nov. 10, 1864, by a conoidal ball which lacerated the scalp and contused the anterior part of the left parietal bone. On Nov. 26th he was admitted to Stanton Hospital, at Washington. There was a necrosis of the cranium one-fourth of an inch in diameter. Low diet and gentle purgatives were prescribed, and, as suppuration became established, emollient poultices were applied to the wound. On Dec. 21st the contused portion of bone was found to be loosened by the process of absorption and suppuration. The patient was placed under chloroform, and, through a crucial incision, a piece of the external table of the left parietal bone half an inch in diameter, and a corresponding piece of the internal table of that bone one-fourth of an inch in diameter,

were extracted. On the 29th, another small piece of bone, consisting of both tables, was removed from the inferior margin of the wound. Water dressings were applied. The patient made a rapid recovery, without any untoward symptoms; but it was thought inexpedient to return him to active service in the field. He did efficient duty for some months as a nurse in the hospital. When discharged on the general muster out of troops, June 15, 1865, he was in excellent health. His name does not appear on the list of applicants for pension. The fragments of necrosed bone are preserved in the Army Medical Museum, and figured in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 123.

*Comments.*—In this case, the necrosed part was found to be completely separated and detached from the living bone on Dec. 21, *i. e.* forty-one days after the injury was inflicted. The external table was likewise destroyed much more extensively than the internal. Now when a portion of any cranial bone has been killed by contusion, or suffered primary necrosis, Nature proceeds at once to slowly separate and detach the dead from the living osseous tissue, in order that it may be rendered harmless, and expelled from the system. This object is spontaneously accomplished in a beautiful manner by the occurrence of fungating osteitis, that is, by the transformation of the histological elements of the living osseous tissue where it borders upon the necrosed part, into soft, red, medullary or granulation tissue. The calcareous matter disappears under the local excitement occasioned by the dead bone acting as an irritant, the intercellular or basis-substance softens, the bone-corpuscles change into rapidly proliferating medullary cells, the blood-supply is largely augmented, and thus the hard osseous becomes transformed into soft, red medullary or granulation tissue around the necrosed fragment (Virchow). Thus, after the lapse of some weeks, the dead remains connected with the living part of the bone only by an intervening lamina of delicate fleshy granulations formed at the expense of the living osseous tissue. Thus, it happens, that when we examine the dry specimens illustrating necrosis, which are preserved in pathological cabinets, we generally find the cavity to be larger than the necrosed fragments which come from or belong within it. This detachment of the dead from the living bone was completed in the case of Henry Abbott in about six weeks, and in the case just related in about six weeks also. On extracting the loosened necrosed fragment, we usually find its bed covered over with soft florid granulations, which bleed readily and freely on very slight injury; and the gap left in the bone after its removal usually becomes quickly filled up with them.

The following is likewise an example of primary necrosis involving both tables of the skull in consequence of gunshot injury.

CASE III.—John McGuire, private, Co. G, 65th N. Y. Vols. Gunshot contusion of the frontal bone. Antietam, Sept. 17, 1862. Treated in Carver Hospital at Washington. Exfoliation of both tables of the os frontis resulted, and he suffered from neuralgia. He was discharged from service on Oct. 21, 1862, and his name does not appear on the pension rolls. (*Loc. cit.*, p. 104.)

*Comments.*—The fact that exfoliation of the dead bone was completed in this case within a period of less than five weeks, and that the patient's recovery remained so satisfactory that he did not apply for a pension confirms the opinion that in this case also, the bruised part of the frontal bone was killed outright by the stroke of the bullet. Had this necrosis been consecutive to traumatic inflammation of bone or periosteum, or medullary tissue, the sequestration and discharge of the dead osseous tissue could not by any possibility have been successfully accomplished in this brief period. No, this necrosis could not have been occasioned by any agency other than the blow received from the bullet. Nor is it difficult to perceive how such a blow may destroy the vitality of bony structures, when we take into account the elementary composition of osseous tissue. This kind of injury may instantaneously and completely arrest the nutrition of the bruised portion of bone by stopping the flow into and through it of the nutritive juices and nutritive material, in consequence of the crushing of bone-corpuscles and canaliculi, and the disruption of Haversian canals, and in consequence of the laceration of capillary bloodvessels contained in the Haversian canals and in the medullary spaces, with which such a bullet-stroke upon the skull is attended, and that, too, without the occurrence of any solution of continuity of the cranium that could properly be termed a fracture. Thus the bruised portion of bone perishes for want of nourishment on the part of its basis-substance and cell-structures.

Again, contusions of the cranial bones, which in respect to severity, fall short of necrosing the whole thickness of the skull, may kill the external table only, or some of the exterior laminae of that table, at the place of injury; and, generally when the whole thickness of the skull is killed in this way, the external table is much more extensively destroyed than the internal table, as we have already shown. The lighter grades of cranial contusion are sometimes followed by exfoliation of the exterior laminae whose vitality has been destroyed, not indirectly by detachment of the pericranium, but directly by the contusing force itself. Examples of this sort are not unfrequently produced by blows on the head, and by the kicks of animals on the same part. This form of primary necrosis is also not unfrequently produced in the skull by the impact of gunshot projectiles. The next nine cases are examples in point.

CASE IV.—Wm. McNichols, private, Co. K, 69th Penn. Vols. aged 28. Contusion of the left parietal by a fragment of shell, which lacerated the scalp for three inches or more, Gettysburg, July 2d, 1863. Treated at Mower Hospital, Philadelphia. On August 14th, an exfoliation of the outer table was removed. The patient recovered and was returned to duty on Dec. 16th. His name is not on the pension rolls. (*Loc. cit.*, p. 104.)

CASE V.—Thomas Maxwell, private, Co. K, 5th Michigan Vols., received at the battle of Fredericksburg, Va., December 13, 1862, a gunshot injury of the right side of the cranium, anterior portion. He was,

on December 16th, admitted to the Third Division Hospital at Alexandria. A portion of the outer table exfoliated; otherwise the case progressed favourably, and the patient was returned to duty on May 29, 1863. His name does not appear on the pension list. (*Loc. cit.*, p. 104.)

The next patient was a Confederate soldier, who was treated in the Confederate Hospital at Farmville, Va.:—

CASE VI.—R. Duggins, private, Co. C, 11th South Carolina Regiment, received on June 18, 1864, a gunshot contusion of the left parietal bone. He was admitted to the Confederate Hospital at Farmville, Va., on June 21st. The external table of the parietal exfoliated; otherwise the case did well, and the patient was furloughed on July 8th for sixty days. (*Loc. cit.*, p. 103.)

The patient in the following case was also a Confederate soldier:—

CASE VII.—W. A. Lipscomb, sergeant, Co. C, 5th South Carolina Regiment, was admitted on June 23, 1864, to the Confederate Hospital at Farmville, Va., with a gunshot injury of the right supraorbital region. Gradual exfoliation of the external table followed. The patient was furloughed on July 8th. (*Loc. cit.*, p. 104.)

The next case was likewise treated in the Confederate Hospital at Farmville, Va.:—

CASE VIII.—W. S. Solomon, private, Co. G, 66th North Carolina Regiment, was, on June 20, 1864, admitted to the Confederate Hospital at Farmville, Va., with a gunshot injury of the frontal bone, received on June 18th. Gradual exfoliation of the outer table took place, but the patient did well, and was, on July 8th, furloughed. (*Loc. cit.*, p. 104.)

In the following case the patient was a Confederate officer, who was treated in the Confederate Hospital No. 10, at Richmond, Va.:—

CASE IX.—B. M. Whitmer, captain, Co. G, 3d South Carolina Battalion, received, at the battle of Gettysburg, July 2d, 1863, a gunshot scalp-wound, with contusion of the cranium. He was admitted to the Confederate Hospital, No. 10, Richmond, Va. Exfoliation of the external table took place. Captain Whitmer was furloughed on July 20th. (*Loc. cit.*, p. 105.)

The following case was in the Confederate Hospital at Farmville, Va.:—

CASE X.—J. P. Wilson, lieutenant, Co. B, 9th Virginia Regiment, received, at the battle of Spottsylvania Court House, Va., May 10th, 1864, a gunshot injury of the left parietal bone. The wound of the scalp was about two inches long. He was, on May 24th, admitted to the Confederate Hospital at Farmville, Va. An exfoliation of the bone took place, otherwise the case progressed favourably, and the patient was furloughed on July 1st. He was readmitted on October 1st, suffering from acute dysentery and icterus, and returned to duty on October 29th. The injury of the head gave no further trouble. (*Loc. cit.*, p. 105.)

The exfoliation may be limited to a thin plate of the external table, as it was in the following instance:—

CASE XI.—Franklin Tree, private, Co. A, 20th Maine Volunteers. Contusion and denudation of the vault of the skull for one inch by a musket

ball, Gettysburg, July 3d, 1863. Treated at Seminary and Satterlee Hospitals. A scale of bone exfoliated. The wound then healed, and the man was returned to duty October 23d. His name is not on the pension rolls. (*Loc. cit.*, p. 105.)

The following is an example of contusion and primary necrosis of the skull produced by a buckshot. Some plates of the external table exfoliated.

CASE XII.—Albert Fauck, private, Co. K, 94th Pennsylvania Volunteers, aged 20, was wounded in a skirmish near the Rappahannock by a buckshot, which entered the scalp over the vertex of the cranium, and lodged near the skull. The missile was extracted on the same day. On September 1st, 1862, he was admitted to the Camden Street Hospital, at Baltimore. Some slight exfoliation, not involving the entire thickness of the outer table, took place; then the wound healed kindly, and, on October 11th, the patient was sent to the Convalescent Camp at Fort McHenry for duty. His name does not appear on the pension rolls. (*Loc. cit.*, p. 103.)

*Comments.*—Primary necrosis results so frequently from gunshot contusions of the skull that additional examples belonging to the same category might readily be adduced from the same sources, but further cumulative evidence on this subject seems unnecessary in this connection. We may, however, with propriety remark that, of the foregoing twelve cases wherein necrosis of the cranium was produced by the stroke of gunshot projectiles, all terminated favourably. The dead portions of bone exfoliated, and the patients, doing well in other respects, usually made in the course of three or four months a good recovery. The histories of the foregoing cases also show that the primary necrosis of the skull thus produced by contusion, is in healthy subjects, and under favourable circumstances for treatment, etc., not only comparatively free from danger to life, but also not attended with much pain or other distressing phenomena. The fungating ostitis which separates the dead from the living bone is not, *per se*, a painful proceeding. It is a purely conservative process, instituted and carried on in such cases for the purpose of protecting the living parts from the deleterious effects of the dead bone itself and of the suppuration with which necrosis is always attended.

But, in unhealthy subjects, and in patients whose hygienic surroundings are bad, or who receive, perhaps unavoidably, inadequate, neglectful, or injurious treatment, primary necrosis of the cranium thus produced by contusion does not always pursue this favourable course to a successful issue. Instead thereof, a destructive inflammation may be lighted up in the contiguous soft parts, attended with great pain and much suppuration; or the inflammatory process in an acute form may be kindled in the surrounding osseous tissue, and speedily produce inflammatory necrosis of some considerable part of the bone which had not suffered from the original injury; or the inflammatory process may spread inward to the membranes of the brain, and induce meningitis, followed speedily by death, with symptoms

of compression of the brain; and, in occasional instances, suppurative inflammation having been excited in the medullary tissue of the diploë, pyæmia occurs, and death results therefrom, long ere the process of exfoliation is completed.

2. *Suppurative Inflammation of the Diploë, or Cranial Osteo-Myelitis, resulting from Contusion of the Skull.*—The effects of blows and other kinds of injury, which simply contuse the cranial bones, are not restricted to the pericranium and the compact osseous tissue thereof. The medullary tissue of the diploë, of the Haversian canals, and of the medullary spaces in general, belonging to the injured portion of bone, also gets bruised at the same time, and in the following manner: The impulse of the blow, or other kind of injury which occasions the contusion, extends to all the layers of tissue which enter into the composition of the injured bone considered as a whole, namely, the pericranium, the external table, the diploë with its cancelli full of medullary tissue, and the internal table, and suddenly produces in these several layers more or less strong vibrations which are not rhythmical or harmonious in form, but, on the contrary, are jarring or discordant, since these several structures differ very much in respect to their thickness, toughness, elasticity, and density; and, in the *mêlée* thus engendered, the soft medullary tissue belonging to the diploë, to the Haversian canals, and to the medullary spaces in general, suffers most of all, for it is highly vascular, very rich in cell-formations, and destitute of any protecting frame-work of connective tissue. Hence, the inflammatory processes pertaining to contusions of the cranial bones have, for the most part, their starting-point in the medullary tissue. If the injury be slight, and the subject otherwise healthy, the medullary inflammation is formative in character, and results in induration or eburnation of the affected bone, which, however, is apt to be most strongly marked in the external table; but, if the injury be severe, or the subject unhealthy, the medullary inflammation is suppurative in character, and leads to the filling up of the cancelli of the diploë and the other medullary spaces with purulent matter. The transformation of the red marrow of the skull, under the stimulus of inflammatory irritation, into pus, is attended with the following phenomena: From afflux of blood it swells up and becomes redder still, the free medullary cells, already granular, multiply themselves with very great rapidity and become more granular still, while, at the same time, the intercellular substance softens and soon liquefies: the descendants of the pre-existing marrow cells thus become converted into pus-corpuscles, and the intercellular or basis-substance into liquor puris, or the liquid intercellular material of purulent matter. The following case briefly presents us with an illustrative example.

CASE XIII. *Gunshot Contusion of the Os Frontis: Cephalic Symptoms; Coma; Death; Autopsy; Osteo-myelitis and Osteo-porosis of Injured Part; Meningitis and Cerebral Abscess.*—Ethan A. Crane, musi-



cian, Co. K, 44th New York Volunteers, was wounded at the battle of Cold Harbor, Va., June 3d, 1864, by a conoidal musket-ball, which struck the frontal bone on the right side near the median line and glanced, apparently causing only a flesh wound; the bone was barely bruised. He was admitted to the Fifth Corps Hospital, and, on June 10th, was sent to the Carver Hospital at Washington. The case progressed favourably until June 20th, when grave cephalic symptoms appeared. The patient became comatose within eight hours, and died on June 22d from cerebral complications. The *autopsy* revealed a large abscess in the right anterior lobe of the cerebrum, with meningitis, beneath the seat of injury. The external table of the bone was slightly discoloured and cribriform, while the internal table presented a faint attempt at the formation of a circumscribed area of the effects of osteitis. The diploë was found of a dark yellowish-gray colour, as in cases of osteo-myelitis in the heads of long bones. The pathological specimen is preserved in the Army Medical Museum. (*U. S. Sanitary Commission Memoirs*, First Surgical vol., pp. 317, 318; also *Med. and Surg. History of the War of the Rebellion*, Part First, vol. ii. p. 112.)

*Comments.*—This patient died on the nineteenth day after the wound was inflicted. The cause of death was meningitis and cerebral abscess, which had resulted from spreading of the inflammatory process previously kindled in the cranial walls by gunshot contusion to the contiguous membranes and substance of the brain. The progress of these cerebral complications toward a fatal issue was very rapid, for coma was developed within eight hours, and death occurred on the second day after the appearance of the first adverse symptoms. On examining *post mortem* the affected parts, the products of inflammation of the membranes and substance of the brain were found beneath the site of injury. Moreover, the bruised portion of the os frontis was found to be inflamed all the way through. The external table, the diploë, and the internal table presented certain alterations in structure and appearance which spring solely from inflammatory action. The medullary tissue of the diploë was suppurating, the compact tissue of the external table was discoloured and cribriform or porous, and the dense tissue of the internal table was beginning to be necrosed; or, in other words, the medullary tissue of the diploë was already in the last stage of the inflammatory process, while the laminae belonging to the external and internal tables were yet in the first stages of the same process. The conclusion is irresistible that the traumatic inflammation, which was kindled in the bruised portion of the os frontis in this case, had its starting point in the medullary tissue of the diploë, and spread from it to the calcified tissues of the contiguous parts of both tables. But how do we know that the medullary tissue was undergoing suppuration in this case? some may ask. We state in reply, *firstly*, that we are not acquainted with any way in which the deep-red medullary tissue of the diploë can acquire a dark yellowish-gray colour, except by its conversion, more or less complete, into pus, through the agency of the inflammatory process; and, *secondly*, microscopical examinations of the cancellous structure of the

epiphyses of long bones in strictly analogous cases, *i. e.*, cases of inflammatory disorder of this structure wherein the deep-red marrow has also become changed to a dark yellowish-gray hue, have already shown that such change was due to the metamorphosis of red medullary tissue into purulent matter. The writer has repeatedly witnessed such results on examining microscopically such specimens, and he has reported at least one example belonging to this category, together with an excellent chromo-lithograph illustrating the same, in the *U. S. Sanitary Commission Memoirs*, First Surgical vol., pp. 431, 432, 433, and pl. ix. The part figured in the plate consists of the head and a portion of the shaft of the left os brachii, or rather of the surface of a longitudinal section thereof. The microscopical examination of the cancellous structure of the head of the bone is reported as follows: A specimen taken from the midst of the gray surface of the section, and examined under No. 5, objective, and No. 1, eye-piece of Nachet, was found to contain a large quantity of granular matter, the débris of decomposed pus-corpuscles, with here and there a pus-corpuscle itself. Occasionally a medullary cell also was seen; such cells were granular; their nuclei were large and granular also.

A specimen taken from one of the large cancelli on the border of the gray surface where it joins upon the red, contained a number of fat vesicles, with a large quantity of free oil in the form of very minute globules.

On making a thin transverse section of the compact tissue of the bone, and examining it with a hand-glass, the Haversian canals were seen to be enormously enlarged, especially near the periphery of the bone (circumferential laminæ). In this situation they were so much enlarged as to be easily seen with the unaided eye. These enlarged medullary spaces were stained with the colouring matter of blood (*op. cit.*, p. 433). The next case is, in many respects, similar to the last, while in other respects it is quite dissimilar.

CASE XIV. *Gunshot Contusion of Os Frontis; Cerebral Symptoms; Trephining; Puncturing a Cerebral Abscess; Death; Autopsy; Diploë Carious; Cranial Osteo-myelitis, Osteo-porosis, and Inflammatory Necrosis; No direct connection between the Cerebral Abscess and the Diseased Bone.*—Samuel Altman, private, Co. A, Fiftieth Georgia Regiment, was wounded at the battle of Antietam, September 17, 1862, by a musket ball, which laid bare the os frontis to the extent of two inches in length by three-fourths of an inch in width, without depressing or fracturing the bone. He was admitted into the Convalescent Hospital, Philadelphia, September 27th. The wound granulated rapidly, and the patient was apparently doing well, exhibiting no symptoms of injury of the brain, except that he was sullen and stupid, which was attributed to other causes. On October 6th he complained of headache, chills, and fever, and, on the 8th, cerebral symptoms appeared, and rapidly increased until the 11th, when the indications of approaching dissolution were unmistakable, the pulse being rapid and small, the skin cold, the pupils natural but insensible to light. The patient was etherized, and the operation of trephining performed, in order to evacuate a cerebral abscess that was supposed to exist.

A button of bone was removed, and the brain punctured, giving exit to six or seven ounces of sero-purulent fluid, containing fragments of broken-down brain-tissue, with such force as to spurt three feet from the patient. The effect of the operation was favourable; the skin became warm, the pulse gained strength and was less rapid, the breathing easier, and the patient appeared in every way better. The wound was closed and stimulants administered, but exhaustion followed, and death occurred on October 11th. At the *autopsy*, it was found that the ball had struck the os frontis on the left side, near the coronal suture, two and one-half inches from the middle line of the cranium. The inner table was necrosed over an irregularly circular space, one and one-half inch in diameter, the diploë between the outer and inner tables at this point being carious. There was an abscess, with greenish indurated walls, three inches in diameter, in the anterior lobe of the left cerebral hemisphere. It had burst, and its contents filled the cavities of the brain. There was no pus under the diseased bone on the surface of the brain, and there did not appear to be any immediate connection between the diseased bone and the cerebral abscess. The pathological specimen is preserved in the Army Medical Museum, at Washington. It shows the vault of the cranium, with the disk in place. The internal table is cribriform. The outer table is porous, and discoloured to a slight degree. The pathological specimen is also figured in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 123.

*Comments.*—The carious state of the diploë mentioned above doubtless signifies that the medullary tissue of the diploë had been destroyed through the transformation thereof into purulent matter, by inflammatory action, and that the cancelli of the diploë were filled with this matter, or, in other words, that cranial osteo-myelitis in a far advanced stage was present. The porous condition which was found in the outer table, and the cribriform condition of the inner table, show that these parts also were inflamed, and that the inflammatory process was of a more recent date in them than the corresponding process in the diploë. This case, then, like the last, is an instance where gunshot contusion of the os frontis occasioned destructive inflammation in the medullary tissue of the diploë, which spread therefrom to the contiguous osseous tissue, producing abnormal porosity and necrosis therein. Again, this man survived his injuries twenty-four days, while, in the preceding case, death occurred on the nineteenth day after the injuries were inflicted. We are, therefore, not surprised to find that the inflammatory process in the bruised bone, as disclosed by the autopsy, was somewhat further advanced in its course, in this, than it was in the preceding case.

But this case *differs* from the preceding in some important particulars. For example, in this case death resulted from an immense abscess of the cerebrum, which had not grown out of, and was in no way connected with, the morbid process in the bruised portion of the skull; while, in the preceding case, death resulted from meningitis and cerebral abscess which had been produced by spreading of the inflammatory process from the contused portion of the skull into the membranes and substance of the brain. It is, however, highly probable that the cerebral inflammation,

which led to the fatal result in this case, was traumatic in respect to origin; and that it was produced by injury done to the brain-substance by the same projectile that bruised the frontal bone. Moreover, the sullenness of manner and stupidity of appearance which this patient was observed to exhibit prior to the advent of alarming symptoms, support this view of his case, since these phenomena were most probably due to concussion of the brain, and his history furnishes us with no occasion on which such concussion could have been produced, except the time when his frontal bone was contused by a musket ball.

The presence of a cerebral abscess as the cause of the alarming symptoms was so strongly suspected, that the cranium was penetrated by trephining at the site of injury, and the brain punctured, giving exit thereby to six or seven ounces of sero-purulent matter containing fragments of broken-down cerebral tissue, which escaped with great force from the opening in the skull. This operation prolonged the patient's life somewhat, but did not avert the fatal issue of his case.

*CASE XV. Gunshot Contusion of Os Frontis; Headache; Chills and Vomiting; Trephining; Cranial Osteo-mycelitis and Osteo-porosis were found; Delirium; Thrombosis of Frontal and Orbital Veins. Coma; Death.*—William Attig, private, Co. A, 49th Penna. Vols., aged 25, was wounded near Rappahannock Station, Va., November 7, 1863, by a conoidal musket-ball, which struck his forehead near the left frontal eminence, denuding the bone of its periosteum for about an inch. He was brought to Washington, and admitted to Harewood Hospital on the 9th, complaining of slight headache over the region of the eyes. His pulse was normal, and his appetite poor. On the 17th, chills, with vomiting, supervened, and the eyes became lachrymose. These symptoms continued until the 19th, when he was anæsthetized, the skull laid bare by a crucial incision through the scalp, and pus was found issuing through the denuded bone. The trephine was then applied near the left frontal eminence, giving exit to a small quantity of pus, which was found between the dura mater and the skull. After the operation the patient became free from pain. During the night of the 20th he became delirious, and lay in a stupor nearly all the time, but answered questions correctly. The next morning, the forehead and right eyelids were œdematous; the pulse was seventy-five and feeble. On the 23d, low muttering delirium followed, coma ensued, the alvine evacuations became involuntary, and his breathing stertorous. On the 24th, at 11 A. M., the dura mater was incised, giving exit to a small quantity of pus, but no relief was afforded, and death occurred two hours afterwards. The pathological specimen is preserved in the Army Medical Museum. A figure of it is also presented in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 124.

*Comments.*—The patient in this case complained of pain located in the injured bone when admitted to hospital, on the second day after he had sustained a gunshot contusion of the os frontis, which stripped off the pericranium over a considerable space. Eight days later, chills, vomiting, and head symptoms appeared, which continued for two days, when, on baring the contused bone by a crucial incision through the scalp, pus was

found oozing through the portion thereof that had been denuded by the projectile. The operation of trephining was then performed which liberated a small quantity of pus that was confined between the dura mater and the skull, and gave complete relief from pain. Whence came the purulent matter which was found oozing through the external wound at the site of injury? In all probability, it came from the diploë, and had its origin in suppurative inflammation of the medullary tissue thereof, which had been called into being by the stroke of the missile. On the second day after the operation, the forehead and right eyelids became œdematous, no doubt in consequence of the frontal and orbital veins having become obstructed with coagula spontaneously formed therein, *i. e.*, in consequence of thrombosis of these veins. On the following day symptoms of compression of the brain appeared; and, one day later still, the dura mater was incised with a view to relieve the cerebrum from compression, but without avail, and two hours afterwards death occurred. This man survived his injuries only seventeen days; and his death was, in reality, due to spreading of the inflammatory process from the bruised bone to the membranes and substance of the brain. The first step, however, in the morbid process which thus eventuated in his death, was the suppurative inflammation of the medullary tissue of the diploë, which was started by the stroke of the musket ball on the frontal bone. Thence, the inflammatory process extended itself to the tables of the skull, producing a porous or spongy condition thereof; and, finally, to the meninges and brain-substance, with a fatal result, as stated above. The next case also belongs to the same category as the last.

CASE XVI. *Gunshot Contusion of Right Parietal; Convulsions and Coma on the sixteenth day; Trephining; Death; Autopsy; Suppurative Osteo-myelitis and Diffuse Meningitis.*—Joseph Resinger, private, Co. E, 151st N. Y. Vols., aged 21, received at the demonstration on Mine Run, Va., Nov. 27th, 1863, a gunshot wound of the scalp, over the right parietal bone. He was brought to Fairfax Seminary Hospital. There was no cerebral disturbance at the time of admission. The pericranium was not removed, and it was hoped that the skull had escaped uninjured. He was allowed to be up and about the wards, and no symptoms of any grave injury appeared until December 13th, when he was suddenly seized, while seated at the supper table, with convulsions, and immediately became unconscious. He was taken to his bed, the skull was bared by incision at the seat of injury, and the trephine applied. Pus was found immediately beneath the bone, and it also oozed from the diploë. It was thought expedient to make five perforations with the trephine, in order to remove the diseased bone, and to give free exit to pus. The convulsions did not recur, but the comatose condition continued, and the case terminated fatally twelve hours after the operation. The *autopsy* revealed diffuse inflammation of the arachnoid and of the dura mater. The dura mater was not incised, as it did not bulge into the perforations made with the trephine. The pus proceeded only from the diploë and from between the dura mater and the skull. The specimen is preserved in the Army Medical Museum,

at Washington, and is figured in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 125.

*Comments.*—This man also died on the seventeenth day after his wound was inflicted. The cause of his death too was compression of the brain occasioned by the products of diffuse inflammation of the dura mater and arachnoid. The meningitis itself resulted from an extension of the inflammatory process from the diploë to the inner table of the skull, to the dura mater, and to the parietal and visceral arachnoid. The morbid state of the diploë, with pus oozing from its cancelli, was due to suppurative inflammation of its medullary tissue which had resulted from injury done to that tissue by a gunshot projectile which bruised that portion of the skull. Moreover, meningitis thus induced by spreading of the inflammatory process from the diploë to the membranes of the brain, was one of the most common causes of death after gunshot contusions of the cranial bones among our soldiers during the late war.

CASE XVII. *Contusion of the Right Parietal Bone occasioned by falling on the head; Puffy Swelling and Abscess of the Scalp; Convulsions; Coma; Death. Autopsy: Extensive Necrosis; Recent Meningitis; Large Cerebral Abscess; Cranial Osteo-myelitis (chronic).*—Corporal Joseph B. Hefler, Co. D, 7th Iowa Cavalry, aged 25, was thrown from his horse at Louisville, Ky., April 15th, 1864, falling between his own horse and that of a comrade, and striking somewhere upon his head. His injury was considered to be of a slight character, although he was badly stunned, and he rejoined his company in a day or two afterward. But he suffered from constant headache until about the 29th of August, when a puffy swelling of the scalp appeared over the right parietal bone. An abscess formed which continued to enlarge until it was opened on November 30th. The patient was then transferred to the hospital at Madison, Indiana. On admission there on December 1st, the abscess was exceedingly painful, his pulse was 90, skin dry and hot, tongue coated, and bowels constipated.

*Treatment.*—A free incision was made in the diseased scalp; the right parietal bone was exposed and found denuded for the space of six square inches, and in a necrosed state. The wound was dressed with cataplasms of pulvis ulmi; stimulants and a nutritious diet were ordered. On December 21st, the patient being under chloroform, the opening in the scalp was enlarged and the flaps reflected, with a view to remove the necrosed bone; but upon examination it did not seem to be sufficiently separated to justify operative interference. On January 1st, 1865, brain-symptoms of a very marked character suddenly appeared. He had convulsions recurring in rapid succession for two days, and slight coma, which, however, did not become profound until a short time before death. His mental powers were but little impaired, and he was able to converse intelligently up to a few hours before death, which occurred on January 12th. At the *autopsy* a large abscess was found in the right hemisphere of the cerebrum, communicating with the lateral ventricle, and containing several ounces of offensive pus. There were evidences of recent inflammation of the cerebellum and of the meninges of the brain. The right parietal bone was extensively necrosed and perforated in several places at the seat of injury. The walls of the cranium were observed to be very thin. The thoracic and abdominal viscera were normal.

The foregoing account of this most instructive case has been drawn up partly from original notes thereof received by the writer through the hands of Dr. Elisha Harris, and partly from the record of it contained in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 41, where it is reported under the head of "Miscellaneous Injuries."

*Comments.*—The cranial contusion in the case just related was occasioned, not by a gunshot projectile, but by falling on the head from on horseback. The man also sustained severe concussion of the brain, and was insensible when picked up. However, he soon recovered and returned to duty, and hence his injuries were thought to be but slight. Nevertheless, he afterwards suffered constantly from pain in the head until about the end of August, four and one-half months after the injuries were received, when a puffy swelling of the scalp appeared over the right parietal bone. The interpretation of these symptoms by means of the light thrown upon them by subsequent events in the history of the case, is as follows: The right parietal bone was contused by the fall, and thus traumatic inflammation of a suppurative character was excited in the medullary tissue of the diploë belonging to the injured part of the bone, whereby this tissue was converted into purulent matter and destroyed. Meanwhile the inflammatory process spread over the contiguous osseous laminæ of both tables, reducing them to a porous or spongy condition, and likewise causing several perforations of the bone through which the purulent matter escaped from the suppurating diploë into the pericranial tissue, thereby causing first a puffy swelling, and subsequently an abscess of the scalp which enlarged continually until it was opened by incision some three months afterwards. The headache ceased as soon as the imprisoned matter escaped.<sup>1</sup> Then, as time wore away, the right parietal bone suffered also from necrosis. On December 1st, about three months after the puffy swelling of the scalp made its appearance, the abscess of the scalp which succeeded it was freely incised; the underlying bone was laid bare thereby, and shown to be denuded and *necrosed to the immense extent of six square inches*. Six weeks later still death occurred from compression of the brain which was occasioned by the inflammatory products that had been formed in consequence of the spreading of the inflammatory process from the injured bone to the membranes and substance of the brain.

The porous, spongy, cribriform, or rarefied condition of the compact laminæ of the cranial tables already several times mentioned as a consequence of osteitis is produced in the following way: The inflammatory irritation spreads from the medullary tissue contained in the cancelli and the larger canals of Havers, unto the osseous laminæ which lie in contact

<sup>1</sup> There is good reason for believing that the operation of trephining the external table of the skull, as recommended by Abernethy, so as to secure a free outlet of pus from the diploë, had it been performed at this time, *i. e.*, at the end of August, would have arrested the disease at this stage, and thus have saved the patient. For further information on this point read the last pages of this article.

with that tissue, and produces in those laminæ softening of the intercellular substance with disappearance of the calcareous salts, and conversion of the bone-cells into marrow-corpuscles, or, in other words, it transforms the contiguous osseous laminæ into medullary tissue. The effect of this kind of inflammatory transformation of the osseous tissue is to destroy some of the bony partitions between the cancelli, to diminish the thickness of all that are subjected to its influence, and thus to increase the size of the cancelli, and the medullary spaces, and the Haversian canals.

In the case just related the contused bone was found to have been perforated in several places by the purulent matter that was imprisoned in the diploë, while it was striving to escape from confinement therein. Suppuration here, like all changes attended by an over-production of corpuscular elements, demands space, and sometimes a great deal of space; and the mechanical force exerted by the repeated division and multiplication of the cells is too great to be resisted by the tension of the blood in the vessels when the two forces are opposed to each other in a confined space which is at once inadequate and incapable of expansion. In this way suppuration of the diploë gives rise to the most manifold and profound disturbances of nutrition, especially in the external table, for it derives most of its blood-supply from vessels that run in the diploë.

In the case just related the contused bone was also found to have become extensively necrosed. This morbid condition of the bone was produced in the following manner: As the destructive inflammation of the medullary tissue of the diploë advanced, the inflammatory process which had spread from it to the circumjacent osseous tissue increased in severity, until the capillaries of the Haversian canals became strangled, as it were, by the products of the osseous inflammation itself compressing them against the unyielding walls of these canals. Arrest of circulation, arrest of nutrition, and death or necrosis of the large section of the right parietal bone thus deprived of blood was the necessary consequence thereof. This necrosis was due to *ostitis* which had itself been acquired from inflammation of the contiguous medullary tissue, and was, therefore, secondary in character. Primary *ostitis* is a disorder of extremely rare occurrence. As a secondary disorder, however, it is very frequently met with. It follows both *medullitis* and *periostitis*, but the former much oftener than the latter. Secondary *ostitis* in its mildest form leads to the porous or spongy condition of bone above described, in a severer form the newly made granulation-tissue suppurates, and then we have ulceration and perhaps perforation of bone, or caries, while in its severest form it produces necrosis in the way just shown.

The next case is an example of gunshot contusion of the cranium wherein *pyæmia* supervened with a fatal result. It is reported in the *Medical and Surgical History of the War of the Rebellion* (Part First, vol. ii. p. 84) under the head of "Gunshot Wounds of the Scalp."



Nevertheless, the missile bruised the cranial vault in its passage; and the appearances found on *post-mortem* examination showed that the injury of the bone was of much greater importance than the lesion of the scalp.

CASE XVIII.—Private George Gold, Co. I, 155th Penn. Vols., aged 23, was admitted to Harewood Hospital on Oct. 7th, 1864. He had been wounded at Poplar Grove Church, on Sept. 30th, by a musket ball, which struck the scalp, passing from before backwards, tearing up a portion about three inches in length by one inch in breadth, laying bare the skull and denuding it of pericranium for the space of three inches in length and one inch in breadth, through the middle of which the sagittal suture passed, meeting the coronal at the anterior border. The patient was carefully watched for symptoms indicative of cerebral or meningeal inflammation, but none were manifested up to the moment of his death, unless a slight drowsiness, which, at the time, was attributed to the administration of eight grains of Dover's powder, may be so regarded. He was up and about the ward, complaining of nothing except the wound in the scalp, and receiving no treatment except simple dressings, until the morning of Oct. 18th, when he spoke of a slight pain in the left side of the chest, over the lower lobe of the lung. There was some dulness on percussion over the part complained of, but no marked physical signs of inflammatory mischief. On Oct. 19th, the patient was worse. The pain in the left chest was more severe, resembling that of pleurisy; the pulse was full and frequent; the tongue brown, and rather dry; there was very little cough and no expectoration. On percussion, the right side was very dull over the lower lobe, less so over the upper lobe. The respiratory murmurs were nearly if not quite normal, over the whole of the right lung. Examination by auscultation unsatisfactory, on account of the turbulent action of the heart, and the catching character of the respiration. There were no cephalic or nervous symptoms. On Oct. 20th, the patient appeared more comfortable in the early part of the day, the respiration less laboured, and the pulse more quiet, and the tongue more moist; towards the latter part of the day, however, the symptoms increased in severity. Great dulness over whole of left side of chest was noticed, and greatly diminished resonance on the right side. The vesicular murmur was heard over a small portion of the superior lobe of the left lung only. Moist friction sounds over nearly the whole of the left lung could be heard, together with bronchial respiration, and, at some circumscribed parts, a very coarse crepitation. On the right side the vesicular murmur was rather faint, and greatly obscured by bronchial respiration. On Oct. 21st, there was less pain and dyspnoea, very little cough, with a soft infrequent pulse, pale countenance; and increasing dulness on percussion over the right side. Towards the latter part of the day there was less drowsiness. The patient died at 8½ o'clock, on Oct. 22d. He was perfectly sensible and rational within ten minutes of his death. A *post-mortem* examination was made three hours afterwards. Cadaveric rigidity was strongly marked: the skin of the chest and face was of a deeply jaundiced hue. On making an opening into the chest, about twenty ounces of yellow serum were found in the left pleura, none in the right. The pleural cavities of both sides, but particularly the left, were covered to a considerable extent with coagulable lymph of considerable firmness. The left costal and pulmonary pleuræ were bound strongly together by broad, thick bands, the result of some former disease. There were also a few much less firm attachments on the right side. The

lower lobe of the left lung was in a state of gray hepatization, the upper lobe in that of red hepatization, and in both, at various points, were found circumscribed deposits of pus, containing from one-half a drachm to a drachm each. The lower lobe of the right lung was in a state of red hepatization, and the middle and upper lobes were greatly congested. In the lower lobe were found two or three purulent deposits, which appeared to form centres of inflammation, or metastatic foci. The wound along the scalp appeared as during life. Pus was found along the coronal and sagittal sutures, throughout the whole extent, dissecting the scalp from the bone to the breadth of one inch. The skull was roughened, and deprived of pericranium to that extent. The portion of the bone which had originally been denuded had begun to exfoliate, a line of separation being visible around it. On removing the calvaria, a thin layer of pus was found between the bone and dura mater, extending along the sagittal and coronal sutures to the same extent as on the external surface, the amount of pus within the skull being less than one drachm. There was a narrow strip of the dura mater each side of these sutures which was inflamed; at other parts this membrane was healthy. The arachnoid and pia mater were perfectly normal. The brain and its ventricles, the cerebellum, medulla oblongata, and roots of all the cerebral nerves, were carefully examined, and no lesions were discovered. The heart and its valves, the vena cava, and azygos, the pulmonary veins and arteries, the jugulars, and the bloodvessels of the brain, were in a normal condition. The liver was apparently healthy.

*Comments.*—This man died of acute pyæmia resulting from gunshot contusion of the cranial vault, four days after the appearance of that disorder, and twenty-two days after his wound was inflicted. The foregoing report of his case is very interesting and instructive; it is also very complete in every essential particular, excepting two or three, namely, the anatomical appearances which the bruised portion of the skull itself presented on examination after death, and the condition of the veins of the diploë proceeding from the injured part in respect to their containing coagula, etc. The bruised portion of skull is described as being three inches long and one inch wide, as being denuded of pericranium and bathed in pus exteriorly, as being denuded of dura mater and bathed in pus interiorly, also as being roughened exteriorly, and in a state of incipient necrosis. The condition of the diploë, however, was not inquired into, probably because this part of the examination was inadvertently overlooked. The site of the contusion was high up on the cranial vault, and therefore it was not crossed by the incision made with the saw for the purpose of taking off the skull-cap. A special incision should have been made into the bruised portion of cranium for the purpose of exposing its interior to view. We know, however, from what has been found in strictly analogous cases, that the medullary tissue belonging to the injured part was also involved in suppurative inflammation, and that the cancelli of the diploë were filled with purulent matter. Both the outer and inner table could not have been simultaneously involved in destructive inflammation, as they were in this case, without there being also suppurative inflamma-

tion in the corresponding portion of diploë. As happened in the last five cases, so also in this instance, the stroke of the missile on the skull most probably aroused inflammation of a suppurative character in the medullary tissue underneath the place of impact, which afterwards spread from that tissue to the adjoining tables of the skull.

Prerequisite to the occurrence of pyæmia in any case whatever, is the existence of some local suppuration or some collection of purulent matter; for pyæmia never presents itself as an idiopathic or primary affection, but always as the sequel of some local suppurative inflammation, traumatic in respect to origin, with some very rare exceptions. But traumatic pyæmia is met with much more frequently when certain tissues are wounded than it is when other tissues are the seat of injury. Thus, every surgeon who had much to do with the treatment of wounds and operations in the late war must have noticed how seldom traumatic pyæmia supervened unless the bone was injured. Indeed, I have heard it stated by surgeons of large experience in our military hospitals, that they had never seen a case of traumatic pyæmia which was unconnected with lesion of the osseous tissue. This fact alone shows that in a very large majority of instances traumatic pyæmia results from injury of bone. On this point Mr. Simon says: "Not all surgical patients having wounds have an equal or nearly an equal liability to it. It shows an almost infinite preference for cases where bone structure (particularly cancellous bone structure) has been injured, as in compound fracture or in the surgical procedures of amputation and resection, and all the more, perhaps, in proportion as the injured bone is large." (*Sixth Report of Medical Officer to Privy Council*, p. 61.) We therefore have good reason to believe that, in the case just related, pyæmia resulted from injury, in the form of contusion, of the diploë, and that the local suppurative inflammation from which it directly sprung had its seat in the soft medullary tissue of the diploë, *i. e.*, it was in reality cranial osteo-myelitis of a suppurative character, the product of gunshot contusion of the skull which led to the occurrence of pyæmia in this case.

Perhaps the site of the contused and inflamed portion of skull aided somewhat in the production of pyæmia in the foregoing case, inasmuch as it lay directly over and along the course of the superior longitudinal sinus. It is but fair to suppose that absorption of the pyæmic poison would occur rather more readily from a purulent collection situated in close relation to the great venous canals of the dura mater than it would from a purulent collection situated at some distance away. Moreover, it is not improbable that if the veins of the diploë had been examined at the autopsy, some of those connected with the contused portion of cranium would have been found to be filled with blood clots undergoing puriform transformation, or, in other words, undergoing the process of thrombosis, and thus furnishing the venous emboli which produced pulmonary infarction, etc. The absence of cough, notwithstanding the severity and extent of the secondary

lesion of the lungs, and the hebetude, which were noted in this case, the writer has also observed in many similar cases of acute traumatic pyæmia.

The reports published in the *Medical and Surgical History of the War of the Rebellion*, Part First, vol. ii. pp. 84, 85, "specify five cases of gunshot wounds of the scalp in which pyæmia supervened." One of these five cases was that which has just been related, and which was obviously an example of gunshot contusion of the skull. There is also good reason to believe that the other four cases were, in reality, examples of gunshot contusions of the cranium instead of uncomplicated gunshot wounds of the scalp, and there is nothing in the published account of them which disproves the correctness of this opinion. Indeed, whenever pyæmia presents itself as a sequel to seemingly uncomplicated wounds of the scalp, there is good reason, at least to suspect, that the underlying bone has also been injured, and that its medullary tissue is undergoing suppurative inflammation, whereby it becomes the fountain from which the pyæmic phenomena flow.

The next case belongs to the same category as the last. In it also gunshot contusion of the skull led to the occurrence of pyæmia in an acute form, which resulted in death.

CASE XIX.—G. Brower, sergeant, Co. F, 16th Ohio Vols., received at the siege of Vicksburg, Miss., December 28, 1862, a gunshot wound of the scalp, in the right occipital region, with contusion of the bone. He was conveyed to Paducah, Ky., on the hospital steamer City of Memphis, and admitted on January 13th into the St. Mark's Hospital. There was paralysis of the left leg; pyæmia supervened, and death took place February 21, 1863. (*Loc. cit.*, p. 122.)

CASE XX. *Chronic Pyæmia resulting from Gunshot Contusion of Right Parietal Bone; Death forty-five days after the Wound was inflicted; Autopsy; Injured portion of Bone extensively denuded, porous, and spongy; Meninges very much thickened and blackened.*—Thomas Kennedy, private, Co. M, 1st Mass. Heavy Artillery, aged 30, was wounded at Petersburg, Va., June 16, 1864, by a conoidal-pistol ball, which contused the right parietal bone near the descending branch of the lambdoidal suture. On the 21st he was admitted to the Lincoln Hospital at Washington. Simple dressings were applied, as the injury was considered slight. On July 16th he was furloughed, but he returned on the 29th, stating that while absent he had suffered from ague, and, for the last ten days had had a chill daily. A careful examination of the wound was now made, and a roughness of the external table of the skull was detected. He was much prostrated, but complained of no pain or uneasiness about the head. His pulse was frequent and feeble, tongue dry and red, and the abdomen tympanitic and painful. Three grains of calomel with one-fourth of a grain of opium were ordered every three hours, until the third dose had been taken; meantime tonics and stimulants were given, and afterwards continued in liberal doses. Sinapisms were applied to the epigastrium and extremities. No perceptible improvement, however, was obtained. He died on the afternoon of the 31st, remaining fully sensible, and able to answer questions intelligently until within two or three hours of death.

At the *autopsy* the seat of injury was found to be near the middle of the posterior edge of the right parietal bone. The missile had glanced downward and forward, and was found lying against the skull, two inches from the point of injury. The pericranium was separated a distance of three and three-quarter inches along the track of the missile; the denuded bone was porous and spongy. The line of separation from healthy bone was well marked. Upon removing the skullcap a slight sponginess of the internal table beneath the point of impact was observed. The meninges, for some distance around the seat of injury, were very much thickened and blackened, and firmly adherent to the calvaria. The brain-substance was softened, and the vessels very much congested. The heart, liver, and spleen were flabby. (*Loc. cit.*, p. 111.)

*Comments.*—The diagnosis of chronic pyæmia in this case is founded mainly on the symptoms which were observed during life, interpreted of course by the lesions which were revealed at the autopsy. They clearly show that death did not result directly from inflammation of the bruised portion of skull, nor from inflammation of the membranes of the brain, nor from inflammation of the substance of the brain. The cerebral softening found at the autopsy was not the red or inflammatory kind of softening, but appears to have resulted from impaired nutrition, and to have been brought about in the same way as the flabby condition of the heart, the liver, and the spleen, that were also found at the autopsy. The congestion of the cerebral veins was probably due to the mode of death. Moreover, the morbid state of the heart, liver, spleen, and brain, just described, denotes that the disease which killed this patient had also greatly impaired the nourishing qualities of the blood, *i. e.*, it had made important changes in the composition of the blood, and was therefore a general or constitutional disease most probably of zymotic origin. It was not typhoid fever, because neither the phenomena during life nor the *post-mortem* lesions which characterize that disease were found. It was not ague, nor intermittent, nor remittent paludal fever, because in these days of the liberal use of quinia paludal fevers do not destroy life in the way this man's life was destroyed; and the enlarged spleen and bronzed liver of malarial disease also were not present. This man, then, must have died of septic blood-poisoning in the form of pyæmia, which ran a chronic course, for he survived the pyæmic invasion twelve days. The pyæmic poison got into the general circulation by absorption from the suppurating diploë of the injured portion of skull. His chills were not malarial but pyæmic, in respect to causation. Moreover, pyæmic rigors have not unfrequently been observed to present themselves with considerable regularity, as they did in this case, and thus have readily been mistaken for malarial rigors. The rapidly increasing debility, the great prostration of strength, the frequent and feeble pulse, the dry tongue, the tympanitic and tender belly, associated with but little if any disturbance of the intellect, until death is near, form a combination of symptoms often witnessed in cases of pyæmia; but in no other disorder. The absence, however, of secondary

abscesses of the lungs, liver, etc., is noteworthy; but this is to be said concerning it, namely, that such abscesses are not present in those cases of undoubted pyæmia which eventuate in recovery, and that the formation of such secondary abscesses is not essential to the constitution of the disease. Of fifty-nine cases of undoubted pyæmia treated in the Stanton Military General Hospital during the year ending Sept. 30, 1864, under the writer's direction, fifty-six died and three recovered. Moreover, secondary abscesses in the lungs, liver, etc., are sometimes wanting in those cases of pyæmia where large metastatic abscesses form among the muscles of the extremities.

In regard to the frequency with which pyæmia proves to be the proximate cause of death in cases of gunshot contusion of the cranial bones, theoretical considerations would lead to the belief that purulent infection would be common in gunshot contusions of the skull, in consequence of the entrance of the pyæmic contagium into the veins of the diploë, but the surgical reports of the late war do not sustain the supposition, and present not more than half a dozen cases belonging to this category among the fifty-five deaths which occurred in three hundred and twenty-eight patients with gunshot contusions of the cranial bones whose cases were reported. Pyæmia, however, presents itself with sufficient frequency among the consequences of cranial contusions, and that too in a fatal form, as to make it the duty of the surgeon to do everything he can to prevent its occurrence.

3. *Inflammatory Necrosis with Exfoliation, and Caries, as results of Cranial Contusion.*—Necrotic otitis attended with exfoliation of the dead piece of bone very often results from contusion of the cranial bones, in cases where, for various reasons, it cannot be satisfactorily determined whether the otitis itself is a primary affection, or whether it is a secondary affection, and has been induced by traumatic inflammation of the medullary tissue of the diploë, on the one hand, or by traumatic inflammation of the pericranium on the other. These cases of traumatic otitis, then, whose causal relations and real character are vague and undetermined, we propose to group together under the head of inflammatory necrosis, a term which defines sufficiently well the nature of its origin without attempting to state whether the osseous inflammation has resulted from cranial osteo-myelitis, or from cranial periostitis, or whether it is a primary affection of the bone-tissue itself. But primary otitis in an acute form, by which is meant acute inflammation commencing in the bone-cells and calcified intercellular substance of the osseous tissue, is a disease which is but very rarely met with; while acute medullitis and periostitis, but especially the former, not unfrequently present themselves as primary disorders, resulting from injury. Nor are we surprised at this comparative rarity of acute primary otitis, when we remember how exceedingly vascular and rich in cell-structures the medullary tissue is; while the osseous

tissue proper is among the least vascular of all the tissues of the body, and at the same time is but scantily supplied with corpuscular elements. Ollier, who is very high authority on this subject, says: "Inflammation does not affect the bone-cells proper, except secondarily; its first effects are produced upon the marrow-cells, the osteogenetic layer of the periosteum, and the contents of the Haversian canals." (*American Journal of the Medical Sciences*, January, 1868, p. 152.) However, putting to one side the question as to whether traumatic osteitis ever presents itself as a primary disorder of bone, it is certain that it very often presents itself as a secondary disorder, having for its proximate cause inflammation of the medullary tissue or of the periosteum; and, as a secondary disorder of contused bone, it may run an acute, a subacute, or a chronic course. In the acute and subacute forms of traumatic osteitis suppuration is present, and necrosis of the injured portion of bone is very apt to occur from stoppage of the circulation of blood therein through mechanical pressure exerted by the products of the inflammation, especially by the repeated division and multiplication of the cells thereof upon the capillaries within the unyielding walls of the Haversian canals, etc. Thus the inflow of nutrient blood and of nutrient *matériel* in every form is arrested, and the affected portion of bone perishes, or becomes necrosed, in consequence of such stoppage of nutrition. After some time the dead bone gets separated from the living or sequestered by demarcation or fungating osteitis; and ultimately, in favourable cases, it may be expelled as an exfoliation or a sequestrum. As soon, however, as the necrosed bone is detached from the living it is usually extracted by the surgeon's art.

The next three cases are examples of inflammatory necrosis and exfoliation of parts of the cranium, occurring in consequence of gunshot contusions of the skull.

CASE XXI.—Benjamin Stafford, private, Co. I, 26th N. Y. Vols., was admitted to the Fairfax Seminary Hospital, Sept. 29, 1862, with a gunshot wound over the right side of the frontal bone, received at Antietam, on Sept. 17th. He was returned to duty May 8th, 1863. It was found, however, that the outer table of the os frontis was exfoliating, and the man was discharged from the service on May 28, 1863. He was examined at Utica, N. Y., for a pension, by Dr. H. B. Day, April 22, 1864. It was found that two fragments of bone had exfoliated, and that there was a fistulous sinus through which detached bone could still be felt. (*Loc. cit.*, p. 104.)

CASE XXII.—James H. G., private, Co. A, 90th Penna. Vols. Supposed gunshot scalp-wound over occipital, Antietam, Sept. 17, 1862. Entered hospital at Washington, Sept. 23d. Transferred to Fort Schuyler's Hospital, N. Y., October 7th. Transferred to Fort Hamilton, Dec. 1st. On Dec. 13th, he entered the Satterlee Hospital, Philadelphia, complaining of pain in the occipital region. The wound was closed, but it reopened on Dec. 18th. On January 18, 1863, a circular portion of dead bone, an inch in diameter, was detected by a probe. The patient had no pain or derangement of the mental faculties, and walked actively about

the ward. About Feb. 2d, the discharge from the wound was profuse, and the necrosed bone had not separated. There was no change in his condition until Feb. 25th, when the exfoliation was observed to be loose, and it was extracted through a crucial incision. The exfoliation consisted of a portion of the external table, an inch in diameter, and several smaller pieces. On March 3d yet another piece of the external table was removed. On March 17th the wound was nearly healed. The patient felt entirely well, and on May 22, 1863, he was discharged from the service. He appears to have had no subsequent trouble, since his name does not appear on the list of applicants for pensions. (*Loc. cit.*, p. 103.)

CASE XXIII.—Francis W. Gilkey, Co. K, 10th Penna. Reserves, was wounded in one of the earlier battles of the war, and made a prisoner. In January, 1863, he was exchanged, and received at the Annapolis General Hospital. He had to the right of the vertex a large ulcer, resulting from a gunshot wound of the scalp, extending over the sagittal suture. The skull was necrosed, and probably there had been denudation, with contusion of the bone. Erysipelas supervened, followed by gangrene. When this was arrested exfoliation took place, and the brain was exposed. A necrosed fragment of the parietals, irregularly triangular in shape, two inches long by one inch wide, and embracing both tables, was removed. Granulations sprang up, the wound closed, and the patient recovered without any further complications. He was discharged from the service on January 29, 1863. His name does not appear on the pension roll. The specimen is preserved in the Army Medical Museum. A figure of it is given in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 105.

*Comments.*—The last case is chiefly remarkable for the large size of the exfoliated piece of bone. It was two inches long by one inch wide, and embraced both tables of the skull. If it were profitable so to do many additional examples of inflammatory necrosis and exfoliation of the cranial bones resulting from gunshot contusion might be adduced from the *Medical and Surgical History of the War of the Rebellion*; since exfoliation was frequently observed in gunshot contusions of the skull, and many examples of it are noticed in the categories of other complications.

With regard to *Caries* as a result of contusions of the cranial bones, the experience of our civil war shows that it but seldom occurs, inasmuch as it was met with in but four of the reported cases. Dr. Otis, the accomplished surgical historiographer, says: "Gunshot contusions of the cranial bones were succeeded, in three instances, by caries. This complication, common enough in tertiary syphilis, mercurio-syphilis, and scrofula, rarely occurs as a result of injury, unless there is some constitutional taint. There is no evidence, however, that any such vice of system existed in the cases of which abstracts are subjoined. The energetic treatment advised by authors, such as applications of the ruginé or trepan, the actual cautery, or chloride of zinc, red oxide of mercury, and other potent escharotics were not employed in any of these cases." (*Loc. cit.*, p. 106.)

Next we present a brief account of one of these cases.



CASE XXIV.—Wm. Price, Co. H, 8th Tennessee Infantry, aged 39, received in the engagement near Atlanta, Ga., Aug. 8, 1864, a slight injury of the left parietal bone, and also a flesh wound of the leg. He was taken to the field hospital of the 23d Corps, and on Aug. 15th was admitted to the Asylum Hospital, Knoxville, Tenn. No account of his treatment is recorded. He was discharged from the service on June 20, 1865, and pensioned from that date. On March 1, 1869, pension examining surgeon, R. P. Mitchell, reports that this man was living at Rogersville, Hawkins Co., Tenn.; that he had caries of the skull, bits of bone passing out in the purulent discharge. The wound was still open and suppurating five years subsequent to the injury, and the man was utterly unable to perform manual labour, or to bear exposure to the sun's rays. (*Loc. cit.*, p. 106.)

4. *Inflammation of the Pericranium as a consequence of Contusions of the Skull.*—The experience of our army surgeons during the late war of the rebellion has abundantly shown that cranial periostitis should not be classed among those consequences of cranial contusion which are frequently met with; for protracted inflammation of the bruised pericranium was observed in only a few instances, from the beginning to the end of the conflict. Thus in the *Medical and Surgical History of the War* out of three hundred and twenty-eight cases of gunshot contusions of the cranial bones, only four examples of periostitis of the skull are reported; and not a single instance is given wherein the osteogenetic layer of the pericranium was roused to functional activity by inflammatory excitement, so as to form new laminae of osseous tissue. Moreover, Dr. Otis states that he has carefully examined more than forty crania, contused by gunshot projectiles, without finding even one example of the local hyperostosis of the skull which would have resulted from inflammation of the pericranium, had it really been present. (*Loc. cit.*, p. 127.)

The following is one of the few instances of cranial periostitis that were reported:—

CASE XXV.—Charles Harrick, private, Co. D, 94th N. Y. Vols., aged 25, received at Gettysburg, July 3, 1863, a contusion of the right parietal bone at the lower posterior angle, by a conoidal musket-ball, which lodged under the integuments. He was admitted to Satterlee Hospital, Philadelphia, on July 10th, and on the following day the position of the ball was detected by a probe, and the missile was extracted. A slight scale of the outer table necrosed, and the *pericranium was inflamed for a while*; but the wound ultimately did well, and the soldier was returned to duty Dec. 3, 1863. (*Loc. cit.*, p. 102.) His name is not found on the pension list.

*Comments.*—This example of cranial periostitis occasioned by the impact of a conoidal musket-ball and the irritation due to its remaining in contact with the torn and bruised pericranium, one whole week, before its extraction, serves well to illustrate the kind of inflammation that is kindled in the pericranial membrane of healthy subjects, when badly injured by the impact of, and afterward irritated by contact with, gunshot mis-

siles. Moderate suppuration, and the exfoliation of a slight scale of the outer table occur, then the wound heals, and afterwards the cure remains complete, which is proved by the fact that the man never applies for a pension. And this, too, is all that happens in an exceptionally bad case of traumatic inflammation of the pericranium; for, in the great mass of strictly analogous cases of gunshot contusion of the head, the pericranium gives no trouble whatever.

This example of cranial peritonitis, occasioned by contusion, also shows how small the destructive power really is, which traumatic inflammation of the pericranium can exert upon the contiguous table of the skull. And we are not surprised to find it so, when we consider how small a share the pericranium has in supplying the blood which nourishes the cranial bones; for the skull receives almost all its nutrient blood from vessels which run along the grooves between the dura mater and the inner table, or pass through the tunnel-like canals in the spongy structure of the diploë. The portion which it receives from the vessels of the pericranium is relatively very small. Even the external table gets almost all its nourishment from the walls of the diploë. Hence, it happens that the pericranium can be extensively torn off from the skull, and can be otherwise widely destroyed, by violence or by disease, without the occurrence of any corresponding lesion whatever of the denuded bone. The writer has seen a considerable number of cases wherein some bone was extensively deprived of periosteum, and yet no caries, nor necrosis, nor any morbid change whatever took place. The bones in which he has seen this occurrence were those of the cranium, the face, the thigh, and the leg. T. Holmes bears concurrent testimony. He says: "It is true that large separations, and even extensive destructions, of the periosteum may occur without the death of any portion of the bone, and this is indeed common in the bones of the head and face; but the peculiar circulation in the former, and the great vascularity of all parts in the latter region sufficiently explain this fact." (*System of Surgery*, vol. iii. p. 762.) The following case bears considerable resemblance to the last in several important particulars:—

CASE XXVI.—George D. King, private, Co. I, 21st Mich. Vols., was wounded at the battle of Stone River, Dec. 31, 1862, by a musket ball, which struck behind the left ear and lodged under the scalp, lying against the bone. He was sent to Hospital No. 7, Louisville, Ky. On January 15, 1863, erysipelas supervened. He gradually recovered, and, on April 15th, he was transferred to Hospital No. 19. On the 27th, he was readmitted to Hospital No. 7. Four months after the reception of the injury the ball was extracted. The sense of hearing was entirely destroyed. He was discharged from the service for disability, rated at one-half, on May 16, 1863. A year subsequently, pension-examining surgeon Geo. W. Mears reports that the wound was still discharging slightly. There was probably a scale of the outer table detached. (*Loc. cit.*, pp. 101, 102.)

*Comments.*—This man received a gunshot contusion of the skull; and the musket ball which occasioned it remained unextracted for a period of

four months. It is not improbable that cranial periostitis of a pretty severe character occurred in consequence thereof. Fifteen days after the wound was inflicted erysipelas supervened. It is also not improbable that the pericranial inflammation had a good deal to do in causing the erysipelatous inflammation. It is worthy of special remark in this connection, that *no case of diffuse inflammation of the pericranium was reported during the whole course of the war.*

5. *Meningitis and Encephalitis as consequences of Contusions of the Cranial Bones.*—These formidable disorders were the most common of all the proximate causes of death after gunshot contusions of the cranium, during the late civil war. Out of 328 cases of that form of injury which were reported, 55 patients died; and, in 32, or considerably more than one-half of the fatal cases, “various secondary lesions”—of the brain and its membranes, inflammatory in their nature, were the proximate causes of death. (*Med. and Surg. Hist. of the War of the Rebellion*, Part First, vol. ii. p. 126.) These truly formidable disorders, then, must be ranked among the most important of all the consequences with which gunshot contusions of the skull are attended. Now, we have already presented a considerable number of cases wherein contusions of the skull proved fatal through the spreading of the inflammatory process from the bruised portion of skull to the contiguous membranes and substance of the brain. For the purpose of impressing the reader still more strongly with the great frequency, variety, and importance of this complication, the following examples are added.

CASE XXVII. *Gunshot Contusion of Frontal Bone; Necrotic Ostitis supervened; Meningitis followed; Death twenty-seven days after the wounding; Autopsy.*—Private A. H. Cutting, Co. K, 13th Massachusetts Vols., was wounded at the battle of Gettysburg July 3, 1863, by a conoidal musket-ball, which caused a contusion of the frontal bone, just above and external to the right frontal eminence. He was admitted to Camp Letterman, and thence was sent to the McDougall Hospital, at New York, on July 12th. Meningitis supervened and death ensued, on July 30th, twenty-seven days from the reception of the injury. The osteological specimen is preserved in the Army Medical Museum, at Washington. The injured part of the external table is porous and spongy, and a small scale of bone was evidently in process of exfoliation. The internal table shows no trace of injury beyond the most trivial discoloration. (*Loc. cit.*, pp. 110, 111.) In this case the gunshot contusion obviously gave rise to necrotic ostitis of the bruised part of the frontal bone, which, in turn, occasioned meningitis that proved fatal.

The following is an example of secondary meningo-cerebritis the result of cranial contusion and inflammation, wherein trephining was resorted to but without success.

CASE XXVIII.—Private S. D. Chapman, Co. H, 92d Ohio Volunteers, received at the battle of Chickamauga, Sept. 23, 1863, a gunshot wound of the scalp, near the upper posterior angle of the right parietal, with contusion of the bone. He was sent to Nashville, and admitted to Cumber-

land Hospital, on the 25th. The wound produced little inconvenience until October 4th, when grave head symptoms, such as delirium and convulsions, supervened. There was hemiplegia also. On Oct. 5th, the patient was comatose, and trephining was resorted to. When the skull was perforated, exit was given to a quantity of pus, which had formed between the dura mater and cranium. Consciousness was restored almost immediately, and apparent steady improvement for the next twenty-four hours; but symptoms of compression then recurred, and the patient died on Oct. 9th, sixteen days after the wound was inflicted. At the *autopsy* the right hemisphere was found partially disorganized, and covered with a layer of pus which extended to the longitudinal fissure. (*Ibid.*, p. 124.)

The next case is an example of secondary meningitis and abscess of cerebellum, the result of cranial contusion and inflammation; trephining was also resorted to without success.

CASE XXIX.—Benjamin F. Chappel, sergeant, Co. H, 8th N. Y. Cavalry, aged 27, was wounded before Petersburg, Va., April 1st, 1865, by a pistol ball which entered one inch above and one and a half inches to the left of the occipital protuberance, and emerged just below it on the opposite side, denuding the bone of pericranium. He was admitted to the 3d division hospital of the Cavalry Corps, and, on the 3d, was sent to Washington, where he entered Harewood Hospital on the 5th. Until the 14th, the patient seemed to be improving, but on that day a slight hemorrhage from the occipital artery occurred, causing the loss of about six ounces of arterial blood. The hemorrhage was arrested by compression, and the case apparently progressed favourably. On the evening of the 18th, the patient, however, complained of considerable pain in the region of the cerebellum. On the following day considerable gastric irritation manifested itself, and, at intervals, there was slight delirium. Ether was administered, an incision two and a half inches in length was made, just below and parallel to the lambdoidal suture, the scalp was retracted, the trephine applied, and a disk of bone removed, giving exit to a quantity of pus. The patient reacted promptly after the operation, and seemed to be much relieved, but in the evening he began to sink, and died on the morning of April 21st, twenty days after the wound was inflicted. The *autopsy* revealed a large abscess in the left lobe of the cerebellum, which contained four or five ounces of pus. The medulla oblongata was implicated. The osteological specimen is preserved in the Army Medical Museum at Washington. The bruised portion of bone is slightly discoloured and cribriform (*Ibid.*, pp. 124, 125), *i. e.*, it exhibits the traces of osseous inflammation.

But in one of the instances of cranial contusion from gunshot related above (see Case XIV.) where the trephine was also applied to relieve the symptoms of cerebral compression no pus was found between the skull and dura mater, and no signs whatever of secondary meningitis. There was, however, a large abscess in the left cerebral hemisphere, whose contents were discharged by puncturing the brain-substance through the trephine-hole with a bistoury. This abscess, obviously, was not produced by spreading of the inflammatory process from the bruised skull to the membranes and substance of the brain. It was doubtless due to injury of the brain-tissue itself in the form of concussion, commotion, or contusion thereof, produced by the

same blow that bruised the skull. The cerebral abscess, and the inflammatory necrosis were independent affections which simultaneously resulted from the operation of the same cause. In another case belonging to the category of gunshot contusions of the skull, that of Col. Farnham (*loc. cit.*, pp. 109, 110) the stroke of the missile upon the left parietal contused the pia mater and brain-substance, with ecchymosis thereof, beneath the place of impact, and thus led to the formation of a cerebral abscess, while there were no evidences of inflammatory disorder in the cranial walls; and it often happens in cases of cranial contusion that the patient suffers much more from the mechanical injury which the brain-substance sustains thereby, than from the bruising of the bone.

To the last-named category, *i. e.*, to concurrent injury of the brain, rather than to injury of the skull, belong the numerous cases of *persistent headache, vertigo, disordered vision, deafness, chronic irritability of the brain, epilepsy, aphasia, paralysis, and mental aberration*, which were observed in the persons of those who sustained gunshot contusions of the cranium during the late civil war, amounting in all to 104, out of 328 reported cases of that form of injury. (*Loc. cit.*, pp. 113-121.)

*Treatment of Contusions of the Cranial Bones.*—The plan of treatment which should be followed in cases of injury of the head, when there is reason to believe that the skull is bruised, whether it be from the stroke of bullets, or from blows or kicks or falls on the head, or from any other cause whatever, requires first of all the procurement of corporal and mental rest as nearly absolute as practicable under the circumstances which surround the patient. He should be confined to bed in a sitting or semi-recumbent posture with his head comfortably supported in this elevated position, and all noises or loud sounds, and other cerebral excitants of every kind, should be carefully excluded; in short, everything that is possible should be done to secure quietude of the body as a whole, and quietude of the brain, since *rest* is Nature's almost universal remedy.

The following example illustrates some of the bad effects of inattention to this most important precept:—

CASE XXX.—Charles K. Baker, private, Co. D, 27th Mass. Vols., aged 25, was wounded at the battle of Newberne, N. C., March 14, 1862, by a conoidal musket-ball, which made a long furrowed wound of the right parietal region, lacerating the scalp and denuding the pericranium. He was treated at a field hospital by his regimental surgeon. The right side of the head was shaven, and a compress dipped in cold water was secured over the wound by a bandage. The patient was required to keep his bed in the log hut used as an hospital, and to observe a strict diet. He had no headache, nor any symptom of disturbance of the brain. Careful exploration revealed no injury of the bone. On March 20th the wound was fairly cicatrizing, and the patient was sent on an hospital transport up the Neuse River to the Carver Street Hospital at Newberne, five miles distant. Two days subsequently, through the inadvertence of an hospital steward, this man's name was placed in the list of wounded to be sent

northward on the hospital steamer New York. Surgeon J. B. Upham, in charge thereof, reports that he had no cerebral symptoms on the passage. He proceeded to his home in Amherst, Mass. On April 3d he complained of headache, and on the next day symptoms of compression of the brain appeared. On April 7th he was trephined, and died a few hours after the operation. (*Loc. cit.*, p. 124.)

No doubt this man's chances of recovery were greatly lessened by removing him from the hospital wherein he was first placed; and we may with propriety here remark in a general way, that the practice of transferring patients belonging to this category from hospital to hospital, prior to recovery, which obtained during our war of the Rebellion, as shown by the record of many cases related in the foregoing pages, was highly detrimental to most of these patients, and, in all probability, occasioned the loss of some lives which might otherwise have been saved.

Besides rest of body and mind, the patient's diet should be rather spare, and restricted to articles that are nutritious and of easy digestion, but not stimulating in their nature.

The ice-bag should be applied to the bruised part for the purpose of keeping down the inflammatory process therein; *i. e.*, in order to prevent its becoming suppurative and necrotic, on the one hand, and to protect the membranes and substances of the brain from its invasion, on the other. The ice-bag should be constantly kept on the injured part, both day and night, until all danger has been passed; and compresses should be interposed between the ice-bag and the scalp of sufficient thickness to prevent discomfort. In cases where pyrexia, headache, and other symptoms of meningo-cerebral inflammation appear, aconite in full doses and mercurial purges can be administered with advantage; and in sthenic cases blood can be drawn locally by leeches or cups, with decided benefit. Symptoms of cerebral compression, when due to the exudation of serum, can be combated by blistering the neck, by hydragogue cathartics, and by exhibiting potassium iodide in ten-grain doses every four hours. But for the purpose of controlling cerebral inflammation, the judicious and methodical application of the ice-bag to the head is of more value than all the other remedies put together. Such, at least, is the lesson which my own experience has taught.

When erysipelas of the scalp supervenes, it should be treated with a strong solution of sodium sulphite externally, and with liberal doses of the sesquichloride of iron and muriate of quinia internally; in bad cases a liberal use of alcoholics should also be made. Fortunately, this complication is of very infrequent occurrence, for but six cases of it are reported among the 328 patients having gunshot contusions of the cranial bones that were observed during our war of the Rebellion (*loc. cit.*, p. 101). When abscesses form beneath the scalp, their contents should be withdrawn at an early period by suitable incisions, followed by poultices. Large cuts should not be made when smaller ones will answer the pur-

pose, because of the vascularity of the scalp and the risk of hemorrhage. The "puffy tumour" of Pott should also be opened at an early period. Concerning this kind of swelling, that sagacious observer remarks: "The inflammation of the dura mater and the formation of matter between it and the skull, in consequence of contusion, is generally indicated and preceded by one [symptom] which I have hardly ever known to fail. I mean a puffy, circumscribed, indolent tumour of the scalp and a spontaneous separation of the pericranium from the skull under such tumour." (Pott's *Chirurg. Works*, vol. i. p. 56.) The surgical history of our war of the Rebellion, however, shows that this form of abscess is by no means of frequent occurrence, since it presented itself in but few of the 328 cases above mentioned. Exfoliations and sequestra should always be extracted as soon as they are completely detached.

Trephining in cases of cranial contusion for intra-cranial abscess was, in Pott's hands, a very successful operation, for by this means he saved five out of eight cases (*op. cit.*, pp. 63-107). But no such success has attended the practice of other surgeons. During our war of the Rebellion, trephining was resorted to for cerebral compression in twelve cases of gunshot contusions of the skull, but without success in every instance. In five of them pus was found between the skull and dura mater, in one case beneath the dura mater, and in two cases in the substance of the brain. In two instances it is alleged that intra-cranial extravasation of blood was found; in four that extensive arachnitis and meningitis were present; in four cases, however, the causes of the symptoms of cerebral compression were not specified (*loc. cit.*, pp. 123-126). Indeed, the successful issue of a case of trephining for intra-cranial abscess, the result of contusion of the skull, is almost unknown to the surgeons of the present day. And although this operation offers but small hope for the relief of cerebral compression when produced by purulent matter or other inflammatory products, the result of cranial contusion, it should not be entirely given up, since it affords the only chance left for saving such cases.

In very rare instances the purulent matter beneath the dura mater is walled in by plastic material in such a way that a perfectly circumscribed abscess is formed. In such instances, as soon as the skull is perforated the dura mater bulges into the trephine-hole; it is also tense and without pulsation. Here, there is no doubt as to what ought to be done. The dura mater should be punctured with a bistoury, and the matter evacuated. Thus, Guthrie saved one of his patients by incising the dura mater. (*Injuries of the Head*, p. 127.) In Roux's case, on withdrawing the trephine a large aperture was found in the dura mater, through which the contents of a circumscribed abscess within the cavity of the arachnoid rapidly escaped, and the patient recovered. (*Archiv. Général. de Méd.*, vol. xxiv. p. 268.) Mr. Dunville's case affords another striking instance of circumscribed suppuration beneath the dura mater, the result of cranial contusion.

The patient, a young girl, was admitted into the Manchester Royal Infirmary for a scalp-wound with denudation of the frontal bone. Three weeks after the injury, symptoms of cerebral compression appeared, and it was thought that a collection of matter had gathered between the dura mater and the skull at the seat of injury. Accordingly, the trephine was applied, but no pus was found on the dura mater. That membrane, however, was whiter and thicker than normal, excepting one point where there was a red spot, which proved to be a small aperture in the dura mater. Through it the flat end of a probe was passed, whereupon a quantity of most offensive pus spirted out. This patient also ultimately got well (*British Med. Journal*, 1858, vol. ii. p. 743). As a *dernier ressort*, then, we should not hesitate to employ the operation of trephining in those cases of contusion of the skull where the symptoms of cerebral compression present themselves in consequence of intra-cranial suppuration, for by so doing we may occasionally rescue a patient from otherwise inevitable death.

In all cases of cranial contusion where suppuration of the diploë occurs, Abernethy strongly recommends that the matter should be discharged, promptly, by trephining the outer table, or, in other words, that abscess of a cranial bone should be treated on the same plan as abscess of any other bone. He says:—

“When matter is formed in the diploë, the pericranium will certainly separate from the bone, and the external table of the skull will undoubtedly perish. In a case so clearly marked, the conduct to be pursued is obvious, which is to remove a portion of the external table with the trephine, so as to discharge the matter collected in the diploë, without which no relief can be obtained. I have seen in several cases, where the operation was performed early, that the external table came away within the circle of the trephine, the matter was discharged from the medullary part of the bone, and the internal table remained sound and entire, covering the dura mater. Granulations soon arose, and the patients got well, with the exfoliation only of a portion of the outer table. The mischievous consequences of delaying the operation, when once the disease is known, must be evident; for the matter collected within the bone, having no outlet, will press on every side, first gradually destroying the diploë, sometimes extending itself over almost the whole of the cranium, and at last occasioning the partial absorption of both tables, so that the skull after death shall be found perforated with a number of holes, like a piece of worm-eaten wood. These holes afford a discharge to the matter, which not only oozes out beneath the pericranium, but also insinuates itself between the skull and dura mater; till at length the patient sinks, worn out by the irritation and fever which this painful and extensive disease creates, unless, as it sometimes happens, he is previously destroyed by inflammation attacking the membranes of the brain.” (*Surgical Observations*, vol. ii. pp. 68, 69, Am. ed. 1811.)

When, therefore, the surgeon finds on incising a “puffy” swelling, or any other swelling of the scalp, in a case of cranial contusion, that there is oozing of purulent matter from the external table of the skull, or when from any cause whatever he becomes satisfied that the diploë is suppurating, he should proceed without delay to expose the diseased bone by suitable incisions, and “to remove a portion of the external table with the tre-



phine, so as to discharge the matter collected in the diploë, without which no relief can be obtained." This operative procedure should be supplemented with antiseptic dressings; and there is good reason to believe that this plan of treatment, especially when begun at the outset of the suppuration, would be attended with most gratifying results.

46 WASHINGTON SQUARE, July 7, 1879.

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#### ARTICLE VII.

TWO CASES OF CLONIC BLEPHAROSPASMUS AS TRAUMATIC REFLEX NEUROSIS. By F. C. HOTZ, M.D., Ophthalmic Surgeon to Illinois Charitable Eye and Ear Infirmary, Chicago, Ill.

THE convulsive action of the orbicularis palpebrarum, which causes the morbid nictitation of the eyelids, is generally due to reflex irritation. It may be excited by the irritation of a foreign body upon the conjunctiva or cornea; it may be caused by acute inflammations of the cornea or conjunctiva; it may be occasioned by the abnormal strain of the organs of accommodation.<sup>1</sup> In some cases the nictitation cannot be accounted for by any local anomaly; but, then, we may find as a remote cause a disorder of the digestive or uterine functions, or an anæmic or debilitated state of the constitution. Still there remains a number of cases of blepharospasmus which, until recently, seemed inexplicable by any apparent cause and were regarded as the result of a bad habit.<sup>2</sup> People take very easily to this idea of a bad habit as an explanation of morbid phenomena, and adhere to it very tenaciously, even though it has long been discarded by the advanced experience of medical science. Some thirty years ago it was an universally accepted doctrine that a child could acquire convergent strabismus by habit, by imitating a cross-eyed child, or by looking steadily at a ribbon or a curl of hair dangling close in front of its eyes. Thanks to the classical works of Von Graefe, Donders, and others, this idea has been thoroughly dispelled from the minds of medical men. But we find it still firmly rooted in the minds of the laity; and it will probably take another quarter of a century, before, at least, the educated class of the people will have abandoned the old idea, and will understand that the development of strabismus depends upon conditions of the eyes on which the will of the child has no influence.

Again, children are often observed breathing with the mouth open; they are scolded and punished for what is supposed to be a bad habit, when a careful examination discloses an obstruction of their nasal passages, due

<sup>1</sup> See Chicago Med. Journal and Examiner, March, 1878.

<sup>2</sup> Mackenzie, Treatise on Diseases of the Eye, 1854.

to a chronic swelling and thickening of the mucous membrane of such degree that the poor children cannot get enough air through the nose and are forced to breathe through the mouth.

It is one of the many great merits which have rendered Von Graefe's name immortal, that he has illuminated the obscurity which enveloped the pathogeny of many cases of blepharospasmus. He was first to show that morbid nictitation without any plausible cause must be regarded as a true reflex neurosis, the primary seat of the irritation being in branches of the trigeminus, others than those distributed in the eyes and its appendages, or in other sensory nerves.<sup>1</sup> In the majority of such cases we can find in the course of the affected nerve a point which is often abnormally sensitive to pressure. And if we press upon these points, we succeed in diminishing or arresting the spasmodic action of the orbicularis muscle. The supra-orbital and infra-orbital foramina are most frequently found to be such *pressure-points*. But more distant nerves also may be the seat of primary irritation. Von Graefe, for instance, could in one case arrest a violent blepharospasmus by pressure upon the arcus glosso-palatinus. In the most cases the history did not give any information in regard to the nature of the pathology of the nerves from which the reflex irritation was transmitted to the orbicularis palpebrarum. In a few cases (observed by Mackenzie), however, the sensory nerve had been wounded and was subsequently involved in cicatricial tissue. The excision of the scar arrested the blepharospasmus.

To these cases I can add the following two, which I trust are interesting enough to warrant their report.

CASE I.—Robert B.—, aged 11, consulted me on Aug. 31, 1878. His mother stated that he was always considered a very nervous child, and that for a long time she had noticed a twitching of his eyelids, which, during the last year, had become worse; and that during the last six months his eyesight seemed to fail, and he could read only five minutes at a time, then the letters would become indistinct; he would get headache, feel dizzy and nauseated, and very often would vomit. Gazing attentively at any object produced the same effect. Sometimes these migraine-like attacks seemed to come upon him without any apparent provocation; he would get up in the morning feeling perfectly well, suddenly a severe pain starting from the back of the head would extend over the right side of his head, followed by obscuration of sight, nausea, dizziness and vomiting. These frequent attacks affected the nutrition of the boy by disturbing the digestion; he lost his appetite, looked pale, and showed deep bluish rings under the eyes. His physician was evidently puzzled by the trouble, and attributed the attacks sometimes to a weakness of the digestive power, at other times he thought the train of symptoms indicated congestion of the brain, and possibly some grave cerebral disorder.

As his eyes had lately given him much trouble, it was considered desirable to ascertain whether there was any serious trouble with them. The eyelids were in a continuous twitching motion, no matter whether

<sup>1</sup> Archiv f. Ophthalm., I., p. 440, and IV. p. 184.

the patient was looking at a near object or gazing inattentively in the distance. Lids, conjunctiva, cornea, and all other tunics of the eyeball were normal. Refraction slightly hypermetropic; H. m.  $\frac{1}{36}$ ;  $V = \frac{20}{8}$ . But with or without + 36 he could read small print for a few moments only. This incapacity for near work, I thought, might be due to what is called accommodative asthenopia. Possibly a great amount of the power of accommodation might be expended to correct an error of refraction; there might be a certain degree of latent hypermetropia or masked astigmatism. Therefore, atropia (in 4 gr. solution) was instilled into each eye three times daily, for four days. After thus being thoroughly atropinized, the eyes, on Sept. 4, showed H.  $\frac{1}{36}$ ;  $V = \frac{20}{8}$ ; no signs of astigmatism. But the spasm of the orbicularis muscle had decreased in violence so markedly that a relation seemed to exist between blepharospasmus and the action of accommodation. Although the strain of the accommodation which was called for by the slight degree of hypermetropia in this case was small, it could be regarded as a sufficient cause of exciting abnormal muscular action in a "nervous" boy. I therefore advised the use of spectacles (convex 36), expecting that the relief of all extra effort of accommodation would arrest the blepharospasmus.

I saw the patient again on Jan. 20, 1879. He had worn the spectacles only four days; they did not give any relief, on the contrary they made his eyes ache and his head dizzy. The nictitation was worse than in August, the clonic spasms involving all the muscles of the face; especially marked were they about the mouth. Failing to control the spasms by regulating the accommodative action, I concluded that they were probably the result of reflex irritation. While I was vainly seeking for "pressure points" in the course of the supra-orbital and infra-orbital nerves, the boy's mother called my attention to the back part of his head. She mentioned that five years ago he fell from a high fence; his feet were caught by the upper end of the laths, he turned a sommersault and struck the back part of his head heavily against the lower railing. A long while after that accident the back of his head and neck had been painful, and ever since then the boy had been afflicted by attacks of headache and nausea. I found no scar in the skin nor any evidence that the skull had been injured by the fall, but the left occipital nerve was exceedingly sensitive upon pressure at the point where it emerges from the attachment of the trapezius muscle to the cranium. Very gentle pressure upon that point caused a sharp pain which radiated over the whole left side of the head to the eyebrows. A similar, though less acute, pain was felt when the patient bent his head back upon his neck. But if I continued the pressure upon the occipital nerve a few minutes, the twitching of the eyelids subsided, and the patient could open and close his eyelids at will. As the result of my examination I gave the opinion that the contusion the occipital nerve sustained at the time of the injury produced a thickening, a callosity of its sheaths, and left the nerve substance under abnormal conditions. I advised the use of the compound ointment of iodide of potassium.

*Feb. 15.* Since the 29th of January the patient had no more twitching and no headache. He has an excellent appetite, and a florid complexion.

*April 20.* The nictitation has not returned; occipital nerve not sensitive to pressure. Boy looks very healthy; has red cheeks and bright eyes. He only complains of frontal headache when he looks fixedly at a near object, for instance, reading over five minutes; never feels it while

out of doors. His headache is due to insufficiency of the internal recti muscles. At twenty feet they can overcome an adducting prism of  $3^{\circ}$  only, and at reading distance ( $12''$ ) even the weakest prism, with its basis turned toward the temples; produces double images.

Instructions were given for methodically exercising the weak muscles. The boy began with reading five minutes at three different times every day; and every day the reading was prolonged by one minute. At last accounts (July 8th) he has been progressing so favourably that he could read thirty minutes and longer without the least difficulty.

In the other case the morbid nictitation could also be traced to the traumatic lesion of a sensory nerve, this time it being the supra-orbital branch of the left trigeminus.

CASE II. L. H., aged 12 years, of Evanston, was examined on February 3, 1879. He has never had any inflammation of the eyes, or any difficulty of vision. In May or June, 1878, while playing at base ball he was struck by the bat over the left eye. The wound bled very freely, and healed up slowly, the left side of the forehead being swollen and sore for quite a long time. Several months ago he discovered that the sight of his left eye was imperfect, distant objects appearing a good deal more distinct with the right eye than with the left. Some time since the eyes, but particularly the left eye, have been feeling somewhat sore, and he has been greatly annoyed by the continuous twitching of his eyelids.

He is very fond of books, and is reading all day. Sometimes during reading a mist comes over his eyes and obscures the print; by winking a few times he can clear away this obscuration.

*Status præsens.*—The eyelids are in a constant motion; they open and shut in rapid alternation. This nictitation persists while the patient is gazing at very distant objects; it is perceptibly increased in violence when he looks at near objects. The lids are normal; the conjunctiva shows a slight degree of hyperæmia, but no hypersecretion of tears or mucus. Exterior of eyeball appears normal; its media are transparent. The *ophthalmoscope* shows normal fundus in both eyes, with slightly hypermetropic refraction of the R. E., and slightly myopic refraction of L. E.

*Vision.*—R. E. H. m.  $\frac{1}{50}$ ; V =  $\frac{20}{20}$ ; reads Jaeg. I between 8 and 30 Cm.; L. E. M.  $\frac{1}{18}$ ; V =  $\frac{20}{20}$ ; reads Jaeg. I between 7 and 15 Cm.

Correction of the ametropia of either eye, or equalizing for reading purposes the refractive power of both eyes by a partial correction of the myopia and an overcorrection of the hypermetropia, has no effect upon the nictitation.

At the region of the left supra orbital foramen the eyebrows are intersected by a perpendicular scar of about two Cm. in length. Around it there is a deep callous infiltration of the size of a twenty-five-cent piece, neither painful nor tender on pressure. If a moderate pressure upon the scar is steadily continued the nictitation gradually abates, and finally the lids can be kept open steadily for several minutes.

From this observation I inferred that the clonic spasms of the lids were probably the result of a reflex irritation. May be that the sheath of the supra-orbital nerve was severely bruised by the blow, and thickened by the subsequent traumatic inflammation, or that it became involved in a callous infiltration and abnormally stretched by the contraction of the cicatricial tissues. Acting upon this supposition I prescribed the com-

pound ointment of potassic iodide to be thoroughly rubbed in over the callous scar. The boy remained under my care during four months, and was entirely relieved of the nictitation as soon as the callous disappeared, although once during that time he had a short relapse, due to the irritation of an intervening conjunctivitis, as the following notes of record may show:—

*Feb. 22.* Infiltration about the cicatrix reduced to the size of a dime. Nictitation markedly diminished.

*March 15.* Since yesterday lids have been acting worse again; callous infiltration is all gone; scar is soft and movable, but conjunctiva of lids is very red; papillæ of upper lids slightly swollen; patient says it feels as though there is some grit under the lids. Ordered solution of sulphate of zinc.

*April 5.* Lids do not wink any oftener than normal; conjunctivitis cured.

*May 15.* No change since last visit.

In these and similar cases, I think, the operation of nerve-stretching could be performed with success if the medicinal applications had not the desired effect.

#### ARTICLE VIII.

THE PATHS OF CONDUCTION OF SENSORY AND MOTOR IMPULSES IN THE CERVICAL SEGMENT OF THE SPINAL CORD. BY ISAAC OTT, M.D., and ROBERT MEADE SMITH, A.M., M.D., Demonstrator of Experimental Physiology in the University of Pennsylvania.

FROM the time when Alexander Walker in 1809 first formed an hypothesis as to the different functions of the columns of the spinal cord no point in the physiology of the nervous system has been more assiduously studied than the paths of conduction in the cord, and yet in no other subject are the views of investigators more unsatisfactory and conflicting. Apart from the intrinsic difficulty of the subject there is no doubt that while many of the discrepancies are to be explained as owing to the study of different regions of the cord in different species of animals, the main source of error must be attributed to a faulty mode of operation. In the old method of free hand section employed by Brown-Séquard, Schiff, and Longet to whom we owe the most generally accepted views on this subject, the portions of the cord which it was desired to retain intact could scarcely avoid being dragged or pressed upon with a necessary consequence of a disturbance of their function and a complication of the results of the operation. The defects of this mode of procedure have been largely removed by the invention of a special instrument by Dr. Woroschiloff, by means of which any portion of the cord can be accurately isolated and divided with-

out the remaining portion being at all contused or dragged upon in the operation. (For description and illustrations of the apparatus see Woroschiloff, *Ludwig's Arbeiten*, 1874, and Cyon, *Methodik der Physiologischen Experimente u. Vivisectionen*, p. 525.)

*Method.*—In all our experiments rabbits were used and our investigations only extended to the cervical region. The animals were fastened on Czermak's holder with the head strongly flexed on the neck; after dividing the skin and muscles by a longitudinal incision and hooking back the muscles by weighted cords, the bony vertebral column was trephined over the second or fourth cervical vertebra and the wound carefully enlarged with sharp cutting bone forceps. When bleeding occurred it was checked by bovista and cotton, sometimes aided by artificial respiration. After making whatever division of the cord that was desired, by means of Woroschiloff's instrument, and carefully closing the wound, the animal was allowed to rest in a warm place for about five hours, by which time the shock had entirely passed off, and the degree of sensibility and voluntary motor power remaining in the different limbs tested.

To test sensibility, the extremities were pinched or irritated by an electric current, or occasionally touched with a hot wire, and if the animal moved its head it was inferred that sensory fibres still existed in the undivided part of the cord; if upon pinching the ears movements were produced in the posterior extremities, the conclusion was reached that all the motor fibres were not divided. After having satisfied ourselves as to the degree of sensibility and voluntary motor power remaining, the cord was divided immediately below the medulla, and artificial respiration kept up. The distal segment of the cervical cord was then irritated with a weak induction current from a Valentin apparatus, and since Woroschiloff has shown that in the cervical cord there appears to be a centre which, when irritated, causes co-ordinated movements in the hind limbs, the movements resulting after such irritation in a rabbit with a partially divided cord, were noted as additional evidence as to the number of motor filaments remaining undivided. In all our experiments the results thus obtained agreed with the conclusions drawn from the degree of motion manifested by irritating the ears, nose, etc. The animal was then killed by stopping the artificial respiration, and the segment of the vertebral column containing the portion of the cord that had been operated on cut out and placed for two days in alcohol; the cord was taken out and freed from its membranes and placed for another day in alcohol, and then transferred to a two per cent. solution of bichromate of ammonium. After hardening the cord was imbedded in paraffine, and sections made in a microtome. The sections showing under the microscope the most extensive division of the cord, were selected as indicating the degree of division accomplished in the operation; they were then suitably mounted and drawn. The sections with one or two exceptions were made above the origin of the nerves,

going to the anterior extremities; in the rabbit these nerves arise from the fourth, fifth, sixth, seventh, and eighth pairs of cervical nerves, and first dorsal.

*Posterior columns.*—The posterior columns have been believed to preside over movements of extension (Bellingeri, Valentin); over movements of flexion (Budge, Harless, Englehardt); both over movement and sensibility (Meckel, Schöeps, Rolando, Calmiel, Jobert); exclusively over sensibility (Bell, Backer, J. Müller, Longet); exclusively over movement (Walker); more over sensibility than movement (Magendie, Seubert); and over anti-peristaltic contractions of the abdominal viscera (Valentin). When associated with gray matter they were supposed to conduct sensation by Fodera, and both sensation and motor impulses by Van Deën and Kürschner. The posterior columns are supposed by Schiff to conduct tactile sensations, and by Todd and Vulpian to be concerned in muscular co-ordination. Several observers (Fodera, Bellingeri, Calmeil, Vulpian, Philipeaux, Brown-Séquard) have stated that division of the posterior columns is followed by hyperæsthesia in the posterior extremities; that after section of one posterior column there is hyperæsthesia on the side of section and anæsthesia on the opposite side (Brown-Séquard, Vulpian), and that hyperæsthesia may be produced by irritation of one posterior column (Vulpian). In our experiments, division of the posterior columns *alone* was followed by no effect but disturbance of muscular co-ordination, more marked when both columns and a portion of gray matter are divided, which gradually passed off in one or two days. No appreciable disturbance of sensation ever occurred. If, however, the section extended through the gray matter then hyperæsthesia occurred, and when the section is made so as to include a small portion of the lateral column, then both loss of sensation and motor power occurred, thus showing that in previous experiments in which these results had been said to follow section of the posterior columns alone, either the neighbouring parts of the cord had been injured in the operation or the division was not accurately confined to the posterior columns.

*Expt. 30.*—Very large rabbit: etherized; tracheotomy. Section of both posterior columns under the second cervical vertebra (Fig. 1) at 11.15 A.M., without hemorrhage; no interference with respiration. 4 P.M., muscular inco-ordination; no paralysis, anæsthesia, or loss of tactile sensibility; no hyperæsthesia. Next day inco-ordination less marked, condition otherwise unchanged.

*Expt. 16.*—Small rabbit: etherized; tracheotomy. Section of right posterior column extending into the gray matter under the second cervical vertebra (Fig. 2) at 11.45 A.M., with very little bleeding. 3 P.M., attitude entirely normal; left anterior foot most sensitive (hyperæsthetic) on pinching; no loss of motion in posterior extremities; in jumping, he uses all his limbs equally well; sensation in posterior extremities seems to be equally diminished; right pupil contracted.

*Expt. 25.*—Large rabbit: etherized; tracheotomy. Section of right posterior column with portion of right lateral column and gray matter under second cervical vertebra at 11.45 P.M., without hemorrhage. 3.30 P.M., there does not seem to be any motor paralysis, although the co-ordination in the posterior extremities

seems to be a little disturbed; the left leg appears to be moved with difficulty, and the animal leans to that side; there is almost absolute loss of sensation in the left hind leg; sensation normal in fore legs.

Fig. 1.

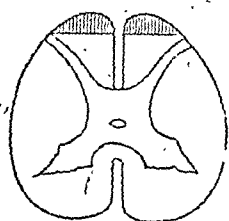
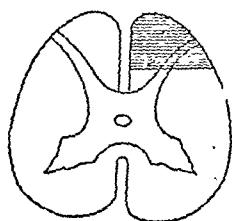


Fig. 2.



*Expt. 12.*—Medium-sized rabbit: etherized; tracheotomy. Section of posterior column, part of gray matter and part of the lateral columns under second cervical vertebra; no disturbance of respiration at 11.45 A. M.; considerable hemorrhage 3.30 P. M. The only effect appears to be marked want of co-ordination; the animal is unable to make any progression; it appears hyperæsthetic all over the body; when the root of the tail is pinched there is a spasmodic contraction of all the erector spinal muscles; when its nose is irritated it makes violent movements in all the limbs.

*Anterior columns.*—The anterior columns have been supposed to preside over movements of flexion (Bellingeri, Valentin); over movements of extension (Budge, Harless, Englehardt); over both movement and sensibility (Meckel, Schœps, Rolando, Calmeil, Jobert); exclusively over sensibility (Walker); exclusively over movement (Ch. Bell, Backer, Longet, Van Deen); more over movement than sensibility (Magendie, Seubert); over peristaltic contractions of the abdominal viscera (Valentin); and when associated with gray matter over both motion and sensation (Van Deen).

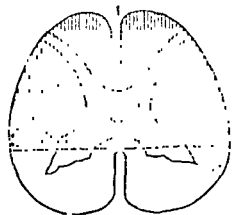
*Antero-lateral columns* are at present almost generally believed to be conductors of voluntary motor impulses (Brown-Séquard, Vulpian, Schiff), while in the dorsal region the motor fibres are supposed mainly to lie in the anterior columns and in the cervical region in the lateral columns (Brown-Séquard, Vulpian), while Brown-Séquard also believes that the antero-lateral regions contain a few sensory fibres.

*The lateral columns* were held by Bell to be the path of the sensory nerves of respiration, an opinion which is accepted by Schiff, though by him it is confined to the cervical region. They were supposed by Türck to contain the paths of sensation, and have been proved by Woroschiloff in the lumbar region of the rabbit to contain all the motor and sensory fibres and by Miescher, Nawrocki, and Dittmar to contain all the sensory and efferent vaso-motor fibres of the cord.

Our experiments show that neither motor nor sensory fibres run in the anterior columns, for when the entire cord, with the exception of the anterior columns is divided, the animal is entirely paralyzed and insensible in all parts below the section. The following experiment shows this:—



Fig. 3.

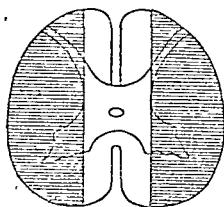


movements in the head but none in the limbs; no voluntary movements exist; medulla oblongata divided; its irritation with induction current causes no movement.

Although this experiment shows that neither motor nor sensory fibres run in the anterior columns in the cervical region, it does not disclose their function. It is probable on anatomical grounds (Schröder) that they consist of longitudinal commissural fibres.

It being proved by the above experiment that neither motor nor sensory fibres run in the anterior columns in the cervical region, the following experiment was made to determine whether they ran through the lateral columns:—

Fig. 4.

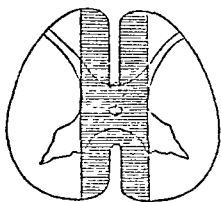


*Expt. 21.*—Small rabbit: etherized; tracheotomy. Section of both lateral columns under second cervical vertebra (Fig. 4) without hemorrhage; at 11 A. M., respiration ceased, artificial respiration kept up; at 4 P. M., entire paralysis and loss of sensation in all limbs; reflex action present; cord divided; its irritation with electricity produced no movement in the limbs below section.

This experiment in which the gray matter, with the exception of a portion of the cornua, was left intact as well as the anterior and posterior columns, while furnishing additional proof that neither motor nor sensory fibres run through the anterior or posterior columns, also shows the falsity of the opinion held by so many observers (Bellingeri, Calmeil, Schiff, Brown-Séguard, Vulpian) that the gray matter alone of the cord is capable of conducting sensory impressions to the brain, or as some have held, both motor and sensory impressions (Van Deen, Kürschner, Stilling, Calmeil).

This position is further strengthened by the following experiment, the converse of the above, in which the gray matter, as well as the anterior and posterior columns, is divided without loss of sensation or motion, the only effect being marked inco-ordination.

Fig. 5.



*Expt. 8.*—Medium-sized female rabbit: etherized; tracheotomy. Section of gray matter under fourth cervical vertebra (Fig. 5) at 11 A. M.; respiration not interfered with; animal lies on its side and is unable to get up; irritating ears with electricity causes powerful co-ordinate movements in posterior extremities; sensation appears normal in all limbs; irritating posterior extremities causes movement in head; medulla divided and irritation causes co-ordinate joint movements in hind leg.

*Decussation of Afferent and Efferent Impulse.*—From the experiments above quoted it has been shown that in the cervical region of the spinal cord the lateral columns form the ordinary paths of conduction between the brain and the gray matter in connection with the roots of the spinal nerves, while it may be inferred that the gray matter serves essentially for the propagation of reflexes from one spinal level to another. These views are entirely in accordance with our anatomical knowledge of the cord. For since the lateral columns increase in area from below upwards much more steadily than either the gray matter or the anterior or posterior columns, it naturally suggests the view that they are the chief paths through which the brain is brought into connection with the several segments of the cord, and thus with the nerves of the body at large, while we also find that the entrance of any large body of nerves into the cord is associated with a large development of gray matter for the local co-ordinating mechanisms (lumbar and cervical enlargements).

The question now arises, are the afferent and efferent impulses conducted directly in the cord or in a crossed manner. As regards the decussation of motor fibres, Van Kempen, Brown-Séquard, and Schiff, held that there was a partial crossing in the cervical region, and in the other portions a direct conduction, while Vulpian and Woroschiloff believe that there is a partial crossing throughout the entire extent of the cord.

As regards the paths of sensation, Van Deen, Stilling, Brown-Séquard, Türk, and Woroschiloff, believe there is a complete crossing throughout the entire cord, Vulpian that it occurs only to a slight extent, while Chauveau, Von Bezold, and Oré, deny any sensory decussation. Miescher, in studying the paths of the afferent vaso-motor fibres, which are probably identical with sensory nerves, found that the fibres from one sensory nerve (sciatic) passed up both sides of the cord, but that they passed more on the opposite than the same side. The following experiments show the results we obtained in this connection.

*Hemisection. Expt. 7.*—Large rabbit: etherized; tracheotomy. Hemisection of cord (*left*) under the fourth cervical vertebra, at 12 M., without hemorrhage. Artificial respiration kept up for fifteen minutes, when the animal breathed naturally, the right side possibly being moved more than the left. 4 P. M., animal lies on its left side and is unable to turn over, makes very violent attempts. Upon pinching the nose it moves only the limbs on the right side; sensation appears to be most marked on the right side, though it is present to a considerable degree in all the limbs; the left anterior extremity is paralyzed, left posterior extremity has diminished motion, electro-sensibility seems everywhere about the same; medulla oblongata divided and irritated, causing co-ordinated jumping movements in the posterior extremities, more violent on the right side; rigidity of right anterior extremity. As the cord lost its irritability, motion first disappeared in the left anterior extremity, then in the left posterior extremity, then in right posterior extremity, and finally in the right anterior extremity.

*Expt. 20.*—Medium-sized rabbit: etherized; tracheotomy. Right hemisection of the cord under the second cervical vertebra at 12.20 P. M., without hemorrhage. 5 P. M., vaso-motor dilatation of the right ear very marked, right pupil smaller; both posterior extremities hyperæsthetic; sensation diminished equally in the anterior extremities; no voluntary motion in the left anterior extremity; motor power very much reduced in both posterior extremities, but is almost

absent in the right posterior extremity; reflex activity marked; under ether sensibility disappears first in left limb; medulla oblongata divided; weak induction currents cause movements in both hind legs; more marked on left side; stronger currents arrested motion in right posterior extremity, while it became stronger in the left limb, and even after removal of the stimulus there occurred a number of alternate flexions and extensions of the left posterior extremity.

*Section of One Lateral Column. Expt. 11.*—Medium-sized rabbit: etherized, tracheotomy. Right lateral column divided between the second and third cervical vertebra (Fig. 6), at 11 A. M.; a little blood was lost in the operation. At the time of section respiration was arrested on one side. 4 P. M., vascular dilatation most marked in the right ear. Right pupil more contracted; hyperæsthesia on the right side; sensation diminished in left posterior extremity; diminished power in posterior extremity, especially in the right; unable to maintain an erect position; irritation of the nose causes movements in both posterior extremities, more marked, however, in the left. Medulla divided, its irritation caused rhythmical movements in both posterior extremities, especially in the left.

Fig. 6.

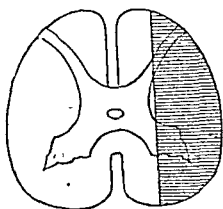


Fig. 7.

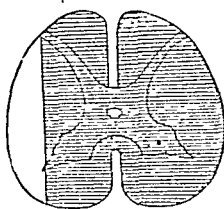
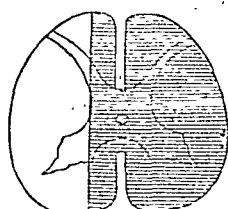


Fig. 8.



*Expt. 19.*—Large male rabbit: etherized; tracheotomy. Section of the right lateral column under the second cervical vertebra at 11.30 A. M., respiration weaker on the right side at 4 P. M. Sensation impaired in the left hind leg; hyperæsthesia in the right posterior extremity; sensation in left posterior extremity almost absent; sensibility more marked in the right posterior extremity; motion more marked in the left posterior extremity; twitching disappeared; animal eats an apple; left posterior extremity more sensitive to electric stimulation than the right. 4 P. M., medulla divided and irritated when movement ensues in the left limbs, very slight in the right, but co-ordinated jumping-like movements take place.

*Section of Entire Cord except one Lateral Column. Expt. 26.*—Medium-sized rabbit: etherized; tracheotomy. Whole cord divided except the left lateral column under the second cervical vertebra (Fig. 7) at 12.30 P. M.; artificial respiration necessary till 3.45 P. M.; some sensibility in all the limbs. When the nose is irritated, the left posterior extremity only is moved; when the medulla is divided and the cord is irritated, there is extension of the right fore limbs and tetanic flexion of the left, while the right posterior extremity is flexed on the trunk and the left extended in tetanus.

*Expt. 29.*—Very small rabbit: etherized; tracheotomy. Cord exposed without hemorrhage; section of entire cord except left lateral column, and a very small quantity of gray matter under the second cervical vertebra (Fig. 8), at 11.53 A. M., without bleeding; respiration ceased on the side of section, 4 P. M.; right ear the most sensitive; on irritating the nose, the animal moves both posterior extremities, the left much more than the right; it also has slight motor power in the left anterior extremity. When the right hind leg is irritated with electricity, coil at 12 cm., motion is caused in the head; irritation of left hind leg only causes movement of head when the coil is at 0; right anterior extremity most sensitive.

From these experiments it is seen that after *hemisection* of the cord sensation is present in all parts behind the section. When the division is made under the fourth cervical vertebra, hyperæsthesia occurs on the opposite side, and not on the side of section as claimed by Schiff, Brown-

Séguard, etc., while, when the division is practised under the second cervical vertebræ, it appears on both sides, but more marked on side of section. After hemisection, motor power is reduced in both posterior extremities, more marked on the side of section, and, when the division is made under the fourth cervical vertebræ, the fore limb on that side is paralyzed, since the section destroys the portion of the cord from which part of the nerves to the anterior extremity arise. The pupil is contracted on the side of section, and there is vaso-motor paralysis of the ear and weakened respiration on the same side.

When all except one *lateral column* is divided, the ear on that side of section is most sensitive; there is vaso-motor paralysis of ear and contracted pupil on same side. Hyperæsthesia occurs in the posterior extremities on the side of section, with diminished sensibility on the opposite side; motor power is diminished in all the limbs, though there is a more marked loss on the side of section; respiration is arrested on the side of section.

It may be concluded, therefore, that there is a partial crossing of both sensory and motor fibres in the cervical portion of the cord in the rabbit, and that there is a greater decussation of sensory fibres than of motor.

The section of a lateral column was followed by hyperæsthesia on that side, thus agreeing with the statement of Woroschiloff, that fibres administering to hyperæsthesia run in that column.

From thirty experiments on rabbits, all of which furnished results in accordance with the examples we have given, we draw the following conclusions:—

1. That the motor and sensory fibres in the cervical segment of the spinal cord run exclusively in the lateral columns.
2. That the nerves administering to respiration, vaso-motor nerves, and cilio-spinal nerves also run in the lateral columns.
3. That the posterior columns are concerned in co-ordination.
4. That irritation of the cervical cord causes co-ordinated jumping movements.
5. That no sensory fibres pass to the brain in the posterior columns.

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#### ARTICLE IX.

OBSERVATIONS ON INFILTRATION OF THE RETINA IN LARDACEOUS DISEASE OF THE KIDNEYS DUE TO CHRONIC SUPPURATION FROM BONE DISEASE.  
By CHARLES STEDMAN BULL, A.M., M.D., Surgeon to the New York Eye Infirmary.

THE connection between a certain variety of retinitis and chronic renal disease, and that between the latter and chronic suppuration from bone

disease are two facts in pathology long since recognized. The latter fact has lately gained in importance owing to the recent discussion in England before the Pathological Society of London, upon the nature and causes of lardaceous disease or amyloid degeneration. In this discussion, though nothing very new was elicited, yet the recognition of two predominant causes, both alone and together, of lardaceous infiltration, viz.: chronic suppuration from bone caries and syphilis, was so unanimous as to aid materially in the further study of this branch of pathology.

Lardaceous disease of the eye and its appendages is of very rare occurrence, and has hitherto been described solely in the lids and conjunctiva. (See Virchow and Hirsch's *Jahresbericht*, 1873, Bd. I. p. 213. *Annali di Ottamologia*, VI, fasc. 2, p. 163. *Finska läkaresällskap. Handl.*, 1875, p. 150 and 1876. *Archives of Ophthalmology*, VIII. No. 1. *Archiv für Ophthalmologie* Bd. XXV. Abth. 1.)

Certain peculiarities in two cases recently under the observation of the writer have excited a suspicion that lardaceous infiltration may possibly occur in the retina as the result of long-continued suppuration from bone-disease with chronic renal disease, primarily of a lardaceous nature. The suspicion has not become a certainty, for though death ensued in both cases, no autopsy could be obtained in either. The patients in both cases were young, and the histories are here given in detail.

CASE I.—Margaret T., æt. 24, single, first seen in January 1879. No strumous taint discernible in any member of the family. No syphilis or rheumatism in the patient, but at the age of eighteen she suffered for nearly a year from malarial poisoning, which however finally disappeared and has never recurred. Eleven years ago, at the age of 13, the left leg was injured by a severe blow upon the crest of the tibia from a fall. This resulted in severe periostitis and necrosis of the bone, which has lasted ever since.

Two operations at different periods for the removal of the diseased bone were performed, with an interval of about a year, but both failed in putting a stop to the destructive process. For the past two years a spine or spicula of bone has protruded through the skin for nearly half an inch, at the junction of the upper and middle thirds of the tibia. This spicula is broad, thick, and roughened, the skin around the opening is livid and presents the ordinary signs of the presence of necrosed bone, and there is a constant thin purulent discharge from the opening. A probe passed in by the side of the protruding spine discovers dead bone in every direction.

During the past year the patient has been in constant ill-health. The menses have been very irregular in time and quantity, and during the past three months have been entirely suppressed. There have been an almost constant headache, occasional vertigo, tinnitus aurium, failing appetite and chronic diarrhœa. There has been at times some œdema of the ankles and face, but not constant. During the past two months there has been a marked febrile attack almost every afternoon, lasting several hours. The amount of urine passed has been very large, especially during the night. There has been no vomiting, no shortness of breath, though there has been slight dyspnoea, and no pain anywhere, except in the head, at any time. During the past four months the vision in both eyes has steadily and some-

what rapidly grown worse, the impairment being most marked in the left eye. For the past year, there has been no treatment of any kind.

When first seen the most marked symptom was the complexion, which was startling in its blanched appearance. The skin of the face and neck was dead white and apparently completely bloodless. The lips and conjunctivæ were almost colourless. The pupils were widely dilated and very sluggish. Radial pulse thready and 90 in the minute. Respirations 20 in the minute, slight but regular. Heart's action feeble but regular. Respiratory murmur heard feebly all over the chest, front and rear. Tinnitus aurium very annoying and constant. Hearing power apparently undisturbed. Drum heads about normal in appearance, and Eustachian tubes freely open.

No central vision with either eye. Eccentrically with nasal side of the retina, right eye  $V = \frac{1}{100}$ ; left eye  $V = \frac{1}{100}$ ; no improvement by any glass. The ophthalmoscopic examination showed a rather uncommon picture. The whole fundus as far forward as the ora serrata presented a brilliant dead white colour, strewn with red spots and lines which proved to be hemorrhages. The optic disk was invisible, but the vessels could be seen converging, though they disappeared at times from view in the infiltration. The infiltration was most dense at the macula and optic disk, and gradually thinned out towards the periphery, there being a difference in elevation of nearly  $\frac{1}{2}$ . The hemorrhages were most numerous on and near the disk, and were much larger here, some of them being great blotches, though they existed all over the fundus in the course of the venous branches. The symptoms were all most marked in the left eye, but there was no red reflex at any point in either eye. The retinal veins were enormously distended and tortuous, and the arteries in places very much diminished in calibre.

The urine was very light coloured, acid, sp. gr. 1010, contained a large amount of albumen, deposited only a slight precipitate on standing, and contained numerous hyaline and fatty casts. About 11 grains of urea to the fluidounce. No pus nor blood-corpuscles. The quantity passed in the twenty-four hours was very nearly two gallons.

An examination of the abdomen showed that both liver and spleen were enlarged, especially the former. There was no tenderness over any portion of the abdomen, but there was in the lumbar region on pressure. An examination of the blood showed a perceptible though not marked increase in the number of the white corpuscles.

The patient had no appetite, the diarrhœa was quite profuse, and a very unfavourable prognosis was therefore made. She remained, however, under observation from early in January till March 3d, when she died. During this interval she was seen every second or third day, but there were few changes to note. The retinal hemorrhages recurred again and again, and no treatment seemed to avail to stop them. The infiltration remained unchanged till the last, and vision very slowly grew worse. During the first part of February the diarrhœa was somewhat checked, and the amount of urine voided was reduced almost to the normal standard. The albumen also diminished very much in amount, and the casts became fewer. But in the last week in February the amount of urine was largely increased and it became loaded with albumen, though the casts were not materially increased in number.

The patient became suddenly comatose on March 2d, and died on the morning of the 3d. No autopsy was permitted.

In this case the infiltration of the retina was entirely different from that which is met with in the so-called retinitis albuminurica, which occurs in detached masses usually in the vicinity of the disk and macula. This was a continuous dense infiltration reaching from macula to ora serrata without a break, and resembled the exudation met with in cases of suppurative choroiditis occurring in cerebro-spinal meningitis or in general pyæmia, except that the infiltration was in the retina. The numerous and extensive hemorrhages also distinguished it from the latter, and certainly pointed to degeneration of the coats of the vessels. In view of the history of the case, the long-continued necrotic process in the bone, the later renal disease, probably at first lardaceous and subsequently becoming fibrous, producing the contracted kidney, is it not possible that the coats of the retinal bloodvessels, and subsequently the retina itself became infiltrated with this same lardaceous material? The appearances shown by the ophthalmoscope were more pronounced and extensive than the writer had ever seen before in the retina, but early in the same month in which the death of the first patient occurred, a second patient presented himself with almost the same condition of the retina, as follows:—

CASE II.—James F., æt. 26, single, sailor, first seen early in March, 1879. The patient is tall, fairly nourished, but of marked strumous diathesis. Has never had syphilis, rheumatism, or malaria. Eight years ago received a severe blow on the left shin from a chain, which bruised the skin extensively and injured the bone to such a degree that necrosis set in and the wound has been open and discharging ever since. He has never had any continuous systematic treatment, and no operative interference has ever been attempted. Small pieces of bone have come away in the purulent discharge at different times. About four years ago he began to be troubled with nausea and headache, with occasional attacks of vertigo. He also complained of blurring of his sight and of some dyspeptic symptoms in addition to the nausea. For several years, he does not know how long, the flow of urine has been markedly increased, so that he was obliged to rise several times at night. About six months ago the blurring of his vision, which had been transient, became permanent and his sight has steadily grown worse, until for the past month he has moved about only with great difficulty and danger. When he presented himself, the most marked feature was here, as in the first case, the complexion. The colour was a dead, pasty-white, of the same tint throughout, and this extended down upon the trunk and limbs. The conjunctiva, lips, and buccal mucous membrane were almost bloodless. The heart's action was feeble and irregular, and there was a well-marked murmur at the base with the first sound. Pulse 96 and feeble. Respiration 30 in the minute, labored, and each inspiration hurried. Auscultation and percussion showed a small amount of fluid in the left pleural cavity. The patient's liver was enlarged to a marked degree and was sensitive to pressure, and he said he had had an obstinate diarrhoea for several months, but that just at this time it was better. He still passed about six quarts of urine daily, which was very pale in colour, had a slight deposit on standing, was acid, sp. gr. 1012. It was loaded with albumen, and contained large numbers of hyaline and fatty casts.

Right eye  $V = \frac{4}{200}$  eccentrically.

Left eye  $V =$  movements of the hand eccentrically.

Vision in this case was not limited to the nasal halves of the retina, but extended irregularly in all directions towards the temporal side. An ophthalmoscopic examination revealed almost the counterpart of the eyes of the first patient, but with a difference. In the *left* eye the infiltration was continuous and solid from macula to extreme periphery, of a dead white colour, interspersed with numerous red blotches, some old, others recent, which were hemorrhages from the retinal vessels. In the *right* eye the infiltration was not continuous from macula to periphery, but there were patches of red choroid visible. Wherever the infiltration existed, however, it was of the same dense white colour, and in this eye also were numerous hemorrhages, some of them quite large. In both eyes the optic disks were not distinguishable, and their situation could only be told by the convergence of the vessels. In places the vessels would disappear, being covered by the infiltration.

Judging from this second case the infiltration first occurs near the nerve and macula, and subsequently invades the whole of the retina.

In the lower third of the left tibia, near its junction with the middle third, was a ragged, unhealthy ulcer leading down to the bone, its edges elevated, uneven, and purple, and all the tissues in the vicinity were swollen and infiltrated. A probe passed into the tibia upward nearly two inches through a large cavity, and about an inch in all other directions. Dead bone could be felt everywhere, and the end of the little finger introduced into the opening, discovered a loose piece of bone, evidently a sequestrum of some size. The discharge from this hole had been profuse, though thin, and still continued.

The patient's condition was precarious, and his friends were told that he might die at any moment. He lived, however, for nearly two months in about the same condition, though his strength steadily failed. The eyes remained unchanged, except that fresh hemorrhages recurred repeatedly. The nausea towards the end was brought on by every attempt to introduce food into the stomach, though brandy was not rejected. The flow of urine diminished somewhat, but the amount of albumen and the casts remained about the same. He grew comatose two days before death and remained so till the end. In this case also it was impossible to obtain an autopsy. The amount of uræa was not determined in this case. The blood was examined, and an increase in the number of the white corpuscles was noted.

A study of these two cases seems to furnish strong evidence of the production of lardaceous disease of the liver and kidney by chronic suppuration in bone tissue with extensive necrosis. It is highly probable that in both cases the primary lardaceous change in the kidney subsequently gave place to a fibrous degeneration with contracted kidney and possibly contracted liver. The retinal disease was in both cases a late complication, and the infiltration was very different from that ordinarily met with in the retina in chronic interstitial nephritis. Albuminuria occurring in cases of long-continued suppuration, or in tuberculous, strumous, syphilitic, or malarial cachexiæ, and accompanied by hypertrophy of the liver and spleen, causes a strong suspicion of lardaceous disease. If with *Cohnheim* and some later authors we regard this change as a degeneration, we must recognize it as directly taking the place of the normal protoplasm of the



cells, muscular fibres, capillary walls, etc. The process, be it infiltration or degeneration, appears almost always in the course of a general disease of pronounced progressive character, which is not limited to a single organ. Whether *Cohnheim* is correct in regarding it as a local degeneration produced by general causes, in which the amyloid substance arises directly from the pre-existing albumen of the tissue, remains still a moot point. *Wagner* regards the lardaceous disease as in all probability a link between albuminates and the fats and cholesterine. As regards the suggestion of lardaceous infiltration of the retina made in the two cases reported, we must recollect that the retina is largely made up of connective tissue, and that lardaceous infiltration of this tissue is a point in pathology still unsettled. At the same time the retina is a highly-developed nervous tissue, and lardaceous disease of nerves has been reported in a number of instances as actually found, so that its occurrence in the retina is certainly possible.

*Dr. Dickinson* holds the view that the special change is an infiltration of the tissues by a material foreign to their healthy nature, which in all probability is brought to them by the bloodvessels, but in this view he stands almost alone among English pathologists. As regards the causation, most writers attribute the change to but two causes, viz.: chronic suppuration and syphilis. Of 83 cases of lardaceous disease collected from the post-mortem records of St. George's Hospital, 73 were in connection either with protracted suppuration or syphilis; of these, suppuration occurred in 62 and syphilis in 18.

*Dr. C. Turner* found a total of 58 cases of lardaceous disease in about 2200 autopsies, and of these there were only 10 in which the disease was not clearly associated with suppuration or syphilis.

According to *Dr. Hilton Fagge*, there occurred in Guy's Hospital 244 cases of lardaceous disease in 20 years, and of these 154 were due to suppuration without syphilis, and 76 were due to syphilis. Of the latter 34 had bone-disease, leaving 42 cases presumably due to syphilis alone.

As to the way in which suppuration produces the disease, there is an enormous loss of certain constituents of the blood, notably of the white corpuscles, carrying away the potash, and the lardaceous material may be regarded, according to *Dickinson*, as a deposit from the residuum. But in the two cases reported by the writer, there was a slight increase in the number of the white corpuscles instead of a loss.

When we come to consider syphilis as the cause, we are still unsettled as to its mode of action. Of course syphilis involves injury to nutrition in a variety of ways. *Dr. Greenfield* has seen lardaceous disease well-marked in both congenital and acquired syphilis, without any antecedent suppuration. On the other hand *Mr. Hutchinson* deems it improbable that the mere existence of a syphilitic taint could produce the disease without the intervention of a suppurative process. He is inclined to accept one of two explanations of the process; either that the protracted suppuration

attendant on certain severe forms of syphilitic ulceration of skin and bone produces general lardaceous tendencies, just as other prolonged forms of suppuration would, or else that syphilitic gummatous formations are themselves locally liable to lardaceous changes. He recognizes the fact that syphilitic patients occasionally fall into a hopeless cachexia, and that here extensive lardaceous changes are believed to have taken place, but he believes that severe suppuration always precedes the cachexia.

In an interesting paper by E. Bull in the *Nordiskt Medecinskt Arkiv*, Bd. X., 4de Häftet (Nogle Kritiske Betragtninger over den amyloide Degeneration, særlig med Hensyn på dens Varighed og dens Forhold til den Bright'ske Retinit), the author holds that the kidneys are the earliest and most severely affected by amyloid disease of all the organs in the body, and that the disease is immediately marked by albuminuria. In the greater number of cases its duration is as a rule less than a year, and sometimes only a few months. Exudative retinitis he believes does not occur in uncomplicated amyloid degeneration. He also thinks that the cases of long duration of amyloid disease, which have been reported, are due to a faulty conception of the pathological process. They should be regarded as cases of primary renal cirrhosis with subsequent amyloid degeneration occurring towards the end of life. These views are not new, and are the ones generally held now by the profession. They point strongly towards the improbability of retinal complications in pure amyloid disease of the kidneys, and indirectly against any such degeneration of the retina as has been suggested in the two cases reported in this paper. These cases were, however, ophthalmoscopically unique of their kind, at least in the experience of the writer, nor has he seen a report of any similar case. It is not known in what condition the retina was at the beginning of the infiltration, and it is possible that the exudation began as in ordinary Bright's retinitis; but its course and termination were totally different, and the supposition advanced seems not unreasonable, though it is novel. Of course the crucial test, microscopic examination of the infiltrated membrane, is wanting, and hence the histories are defective.

47 EAST TWENTY-THIRD ST., NEW YORK.

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#### ARTICLE X.

CASE OF HYSTERICAL TETANUS. By D. WEBSTER PRENTISS, M.D., Professor of Materia Medica and Therapeutics, National Medical College, Washington, D. C.

Mrs. M., Irish, aged 22 years, married, previous health good, intemperate habits, was confined two years before present attack at Columbia Lying-in Asylum—being at the time unmarried. Lingering labour, with adherent placenta. Four weeks in hospital.

At this date (April 16, 1879) is again pregnant, seven and a half months, having last menstruated August 25, 1878.

*April 16, 1879.* Taken suddenly at 6 P. M. with screeching noise in ears. "Deaf and blind." Tonic spasms of flexor muscles of arms and legs, recurring constantly for two hours. Seen during night by Dr. Glenan; thought to be dying, and was anointed with the "last unction." After two hours got a little rest between the spasms—from five to fifteen minutes—until 1 o'clock, when she went to sleep and slept till morning.

*17th.* Taken again with spasms of muscles at 9 o'clock A. M., lasting two or three minutes, and recurring every fifteen or twenty minutes until 1 o'clock, night, when they ceased and sleep supervened, lasting until morning. Brom. potas. gr. xx; com. spt. ether f5ss was given every two hours without effect, as also was chloral in gr. xx doses.

*18th.* Paroxysms returned at 8 o'clock A. M. with greater violence than ever; marked opisthotonos, the body being bowed until only the head and heels touched the bed. Jaws clinched, eyes closed; unconscious during paroxysms, which lasted about four minutes; passed off with prolonged holding of the breath, succeeded by a deep drawn sigh and complete relaxation. Hydrate chloral gr. xxx was ordered every two hours. She had two or three attacks, each with violent opisthotonos up to 9 P. M., after which she slept all night. Four doses of the chloral (3ij) had been taken. No return of the tetanic spasms the next day.

The patient was greatly debilitated, but recovery was uninterrupted. Labour did not supervene until the regular time.

This case is of interest as presenting rather an unusual form of hysteria, and also in a diagnostic point of view, as being differentiated from tetanus proper and strychnia poisoning.

The thought at first suggested itself that possibly bad whiskey containing strychnia might be to blame for the symptoms presented.

The points in the case marking it as hysterical are:—

1. It was ushered in by noise in the ears, deafness, and blindness.

In true tetanus and strychnia poisoning the senses are rendered preternaturally acute.

2. There was unconsciousness during the paroxysms.

This never occurs in tetanus and strychnia poisoning except as an ante-mortem condition.

3. The eyes were closed during the spasms. The eyes stare widely open in the other diseases.

4. The long uninterrupted sleep at night. In this particular there is a resemblance to chorea. In true tetanus there is no such relief until convalescence. It is noticeable also that no relief followed the administration of chloral until it was given in thirty-grain doses.

## ARTICLE XI.

DISLOCATION OF THE HIP IN CHILDREN: A REPORT OF TWO CASES WITH REMARKS. By V. P. GIBNEY, A.M., M.D., of the Hospital for the Ruptured and Crippled, New York.

THE occurrence of this accident in children is of sufficient rarity to justify me in placing on record two cases alike as to kind yet unlike as to etiology. The one is purely traumatic, and apart from the age of the subject is interesting in a diagnostic point of view as well as in the fact that *six weeks* elapsed before its reduction; the other is a spontaneous dislocation with the early stage of hip disease.

CASE I. *Traumatic Dislocation in a Child aged 4 years; Reduction at end of six weeks by Manipulation; Perfect Restoration.*—On the morning of June 24, 1878, Mrs. F., of Williamsburg, brought her boy Alexander, æt. 4 years, into the out-door department of the hospital, and, from the degree of care with which she handled the child, I suspected some acute disease about one of the larger joints. He could not be induced to stand unless well supported, would make no attempt to walk, was thin, and to all appearance a sufferer. He was, moreover, exceedingly cross, and an examination thoroughly satisfactory was impracticable. I did find, however, as he lay upon the table, a rotation inwards of the right thigh with flexion to an angle of at least  $120^{\circ}$  and a strong degree of adduction. The knee of this side rested across the lower third of left thigh, the trochanter was unusually prominent, and rested on a higher plane than that of left side, the outline of the head of the thigh-bone I fancied could be distinctly made out on the dorsum ilii, and the length of the limb I made out to be between three-quarters and one inch less than that of its fellow. I could make flexion over a small arc, and extend to an angle of about  $140^{\circ}$  without causing any pain, but I could not make any abduction. I learned from the mother that five weeks before this date the child was free from any lameness or sign of disease, that he was playing in the yard at that time, when he fell into a cellar, the door of which had been left open, was picked up by a neighbour and carried into the house crying considerably with pain in his hip; that he was unable to use his limb, and that a degree of deformity existed, so much so, that she called in a doctor, who is reported to have examined the case very carefully and to have found nothing demanding any urgent treatment, but to have ordered the child to bed with limb extended and a pillow between the knees. Since the accident the patient was reported to have rested well at night and to have suffered very little pain.

I had no hesitancy in making a diagnosis of dislocation on the dorsum ilii, and advised the mother to place the child in the hospital. This she declined to do without seeing her husband, and she took the child home to consult his wishes in the matter. She did not report for several days, and then she was unwilling to leave the child. She begged that I treat it as an out-door patient. The case was of such extreme interest that I determined to make the attempt at reduction, and, on the evening of June 29, I had my friend Dr. Jno. H. Ripley, of this city, see the patient with me. He fully confirmed the diagnosis I had already made, and we proceeded at once to reduce the dislocation. Chloroform was administered, and

when anæsthesia was complete, the limb was rotated, while the thumb and fingers grasped the head of the thigh-bone, which could be felt to roll distinctly. The doctor made out the same shortening that I had made out some days previously. With the aid of a towel I held the pelvis quite securely, while Dr. R. manipulated the limb. He flexed the thigh acutely on abdomen, rotated inward, then extended. This was of no avail. He then flexed and abducted and extended, and the deformity remained the same. Every possible manœuvre was resorted to, and for fully one hour we worked without any success whatever. Finally, after a strong adduction and careful extension, the bone could be felt under one's fingers to slip into place. There was no noise made, and we were only assured of our final success by finding the limbs parallel, equal in length, and the movements at the joint normal. A double spica bandage was applied, the limbs bandaged together, straight splints having been bound in popliteal space, and a pad having been placed between the knees. An opiate was ordered for the night.

*July 1.* Find child free from pain, and the mother reports that after the first night he rested very well. The bandages are removed to-day and the limbs remain quite straight; passive motion made with comparative ease and the dressings re-applied. An enema is ordered.

*6th.* Mother brings child to the dispensary to-day and reports that he has rested well and been free from pain since I saw him last (July 1). The limbs are of equal length, and both lie straight and parallel, one with the other. There is a moderate degree of resistance to complete extension, flexion, and adduction, though the thigh can be moved in flexion over an arc of about  $90^{\circ}$  with ease, and rotation can be made with the same degree of facility. Only a spica worn now.

*11th.* Continues to improve. Occasionally has a "catching pain" as he walks.

*24th.* Flexion can be made over the normal arc; rotation not quite perfect. Walks much, and a very slight halt is observable.

*Aug. 3.* Walks and runs quite freely, and I cannot detect any halt in his gait. The mother says she cannot tell by his walking which is the lame limb. Flexion and extension perfect and painless; rotation nearly so; a scarcely appreciable change in the nates; no atrophy; no shortening; general health good.

*Jan. 8, 1879.* In tracing out some cases I called at the residence of this patient and found that he had been free from any pain or lameness since the date of his last visit (Aug. 3). I had him stripped, and on a thorough examination I could find no symptom or sign of disease about the joint. His rotation was perfect.

Dr. Hamilton, while regarding dislocation in a child at this age as rare, very truly remarks: "Coxo-femoral dislocations may occur at any period of life." I find by reference to modern literature of the subject that the accident has happened to children as young as eighteen months. It is quite unnecessary for me to refer to the cases under ten years, or under six even, that have been reported within the past few years. The textbooks on surgery contain such as are well authenticated.

It seemed difficult to imagine how any error in diagnosis could have

occurred, and yet such appears to have been the case. There was certainly the history of the fall, the deformity and the acuteness of invasion. We are taught that hip disease comes from a fall, and hence the average practitioner feels satisfied when he gets this etiological factor. He seems to forget that hip disease goes through stages, and that a *long time* must elapse before such a deformity as was described in this case can take place.

If this injury were not severe enough to induce an arthritis, then it is useless to talk of falls as causing hip disease. It is fair to assume that the ligamentum teres was either torn across or severely stretched, and we must admit a certain amount of injury done the capsular ligament. Then, too, the bruising and pulling and torsion that was incident to the efforts at reduction were certainly sufficient to cause disease in the joint, even if it had already escaped permanent injury.

There are cases, it is true, wherein violent inflammatory reaction has followed prolonged manipulation in the effort at reduction.

The period of time that had elapsed in this instance was not sufficient to justify me in dismissing the case without an attempt to restore the head of the bone to the acetabulum. Sir Astley Cooper fixed eight weeks as the limit beyond which it is dangerous to make the attempt. Most all authors dwell on the dangers attendant thereon, and cite numerous examples. For a full history I need only refer my readers to that classical work with which every tyro even in surgery should be familiar, viz.: Hamilton on Fractures and Dislocations, to which reference has already been made.

One other point in connection with this case, and I pass to the narration of the second. The head slipped in without that well-known "click" so pleasing to the ear of the operator. In many of the reported cases of ancient dislocation reduced, I see almost invariable mention of this "click" as occurring, however late the reduction.

Erichsen states in speaking of the effects of a dislocation left unreduced:—

"If the articulation be an orbicular one, as the shoulder or hip, the cavity, whether glenoid or acetabular, undergoes very gradual changes in outline and depth; its circumference becomes contracted, less regular, more angular, and the hollow eventually shallows. These changes are so slow in the adult that several years will elapse before they have gone to such a degree as to prevent the displaced head of the bone from being put back. In *children and young people* [my own italics] they are more rapid and complete, and the cavity fills up with a dense fibrous deposit."<sup>1</sup>

**CASE II.** *Spontaneous Dislocation occurring in the early stage of Hip Disease; Reduction.*—During the month of May of the present year a female patient aged nine years, was in the hospital convalescing from a recurring acute attack of hip disease. She had for some weeks been walking and running about with scarcely a halt in her gait, when on May 26th a member of the house staff observed a shortening of the limb, and a refusal on the part of the child to walk. Dr. Knight's attention was called to the case, and an examination revealed an unmistakable dislocation on the dorsum ilii. The limb was shortened one inch, was apparently much

<sup>1</sup> The Science and Art of Surgery, Phila., 1878, vol. i. pp. 458, 459.

shorter, the thigh was semi-flexed, rotated inward, and adducted. A few days before this the limbs were of equal length, and were free from any deformity. The child reported that she fell out of her bed a night or two previously, but on a careful investigation, this was found impracticable, as the beds in the dormitory are so close one to the other, that a child could not fall between them. Furthermore, on questioning both the day nurse and the night nurse, as well as the children who sleep contiguous, no one saw her fall from the bed, and all are positive that she did not.

I was in the country at this time, and as I was expected home every day Dr. Knight postponed the reduction until my return.

*May 30.* Chloroform administered and the diagnosis was fully confirmed. After a few minutes at manipulation, the head of the femur slipped into place without any "click." Measurement made, and limbs found equal in length. While applying a roller about the hips, the head of the bone slipped again but was easily replaced. No grating could be felt. Extension by weight was made, and during the day she suffered considerable pain in paroxysms.

*31st.* Limb retained in position, though the child required an opiate to secure rest through the night.

*June 2d.* Extension removed, firm spica applied with pad above trochanter and child carefully placed in a rolling chair.

*4th.* Doing well; pains not so great.

*14th.* Since date of last note the case has progressed as well as we could expect. The dressings have been carefully removed and reapplied every other day to avoid excoriations. Any movements at the joint have caused the child to scream aloud. This noon while passing through the ward, I observed the limb sharply flexed, adducted, and rotated inward, along with a marked degree of shortening. An anæsthetic was administered, and I could feel the head of the bone distinctly on the dorsum, and made out one and a half inch shortening. It was easily reduced and child placed in bed with usual precautions.

*15th.* This morning the hip is dislocated again. Dr. Ap. M. Vauce, a member of the staff, makes a splint of Manilla paper and glue in the same manner as he makes his spinal jackets. He gets his cast from a boy whose limb is equal in length and size to our patient's, and the whole dressing dries and is ready for application by this evening.

*16th.* Splint applied after reduction is made; it grasps the pelvis in a broad band, and completely encases thigh and knee and is held securely by a lacing in front throughout the whole length.

*22d.* We have had no difficulty with the limb since the paper splint was applied. The child goes about now quite freely by aid of a chair. We have had no excoriations.

*July 30.* Date of present writing. Limb equal in length with its fellow. No deformity, child free from pain, and case in every way doing well.

The history prior to the dislocation is of much interest in illustrating the peculiar course taken by the hip-disease, and is as follows:—

*Aug. 13, 1877,* she was admitted to the hospital, and nothing reliable could be learned concerning the health of either father or mother. The patient herself was one of fifteen children, six of whom had died of the ordinary diseases of infancy. She was healthy during infancy, and a pertussis at the age of four without a sequel was all the disease she had ever had.

Four months ago she began to limp and complain of pain in the left ankle. She is reported to have sustained a slight fall about this time, and to this accident was attributed her lameness.

On admission she is found fairly nourished, stands squarely on both feet, and walks quite freely, though favouring left side. The spinal column is normal to the usual tests; the left nates is flattened a little while the fold is unchanged; no tenderness on pressure in groin or over trochanter, and the child does not complain of pain if pressure be made at any point around the hip or along thigh; no single muscle or group of muscles shows any contraction. In the dorsal decubitus (examination made on the hard floor) the thigh can be completely extended without resistance; ab- and adduction easily performed but there is resistance to complete flexion, although the child does not complain of pain; no atrophy of thigh or leg, and no shortening. A diagnosis of hip disease first stage was made and the treatment was expectant.

Oct. 2. Not an outward symptom or sign has developed since her admission; even those present then have subsided, and we are disposed to question the diagnosis. Discharged this day without any evidence of disease or deformity.

March 12, 1878. Readmitted this date. Unable to walk without great difficulty, and in this act leans forward and rests hand on the knee. The relapse is of two weeks' standing. About six weeks ago she had scarlatina with enlarged cervical glands as sequel. The thigh is flexed at 90° and is rotated outwards. There is no especial fulness or induration about the trochanter or in the groin.

14th. Has cried much with pain during the past two nights, and fly blister to the hip is applied. Poultices to follow.

22d. Since date of last note has experienced great relief; walks with a mere trace of a limp, has no pain at nights, the limb is perfectly straight, motion at the joint is good, and there is scarcely any appreciable change in the nates.

Aug. 5. Has had no sign of relapse since last spring. She has just returned from a visit home, and would be discharged but for an occasional halt in her gait, and a resistance to complete flexion.

March 15, 1879. Condition unchanged and we still hesitate about granting a discharge.

17th. For past two days has been very lame, and the limb is apparently lengthened. This is the season when the "walking mania" is at its height, and her relapse is possibly due to over-exertion, as the children in the hospital have caught the infection. Rest is enjoined.

23d. Relieved, and her condition is now as it was before the 15th. She continued thus apparently cured until the date of the dislocation in May, which has already been fully described.

Commenting on this case, I feel no hesitancy in predicating spontaneous of this dislocation. Whether it occurred as the child was falling asleep or towards morning I am unable to state. The case reported by Mr. Hilton<sup>1</sup> was one wherein the dislocation occurred just as the patient was falling asleep; and commenting on this he says:—

"Here I think it worthy of a passing consideration to inquire why it is that these dislocations from disease almost always occur just as the patient is falling

<sup>1</sup> Lancet, vol. ii., 1868, p. 2, also in "Lectures on Rest and Pain."



off to sleep. It is then that volition has withdrawn its influence from the nervous system generally, and the excito-motor function of the spinal cord seems to obtain an exclusive authority over the limbs, and produces the involuntary spasmodic condition of the muscles which causes these displacements."<sup>1</sup>

The case I have reported differs from most of those already on record. Until the remarkable paper of Dr. Alden March in 1853, before the American Medical Association, dislocation of the hip in hip disease was regarded by nearly all of the surgical authorities as of frequent occurrence. It was of so frequent occurrence, said they, that we must expect nothing else in the advanced stage of the disease. Dr. March took the position that "*spontaneous dislocation of the hip (as purely the result of morbid action unaided by superadded violence) seldom or never takes place;*"<sup>2</sup> and he proved his position by overwhelming evidence. He stated that the symptoms which are usually relied on during life as diagnostic of an idiopathic dislocation can be explained "in the strongly marked organic changes in the form and relations of the head of the femur and acetabulum."<sup>3</sup> I have myself demonstrated another element in the production of this deformity, with specimens presented at the New York Pathological Society,<sup>4</sup> viz., a change in the angle which the neck sustains to the femur—in disease the angle is changed sometimes from an obtuse to an acute angle.

In a pretty careful search through such literature as I have at hand I am unable to find any cases recorded wherein the dislocation occurred in the early stage of the disease, and one might say that the case I have reported was not one in point. The facts are: signs of disease beginning in May, 1877; gradual disappearance of every sign by October 2 of same year; perfect immunity from lameness or deformity until February, 1878; scarlatina, and relapse of disease at hip; re-admission to hospital with acute symptoms; almost perfect recovery within a month, and this condition maintained for one year; then the dislocation coming on at night. It will be seen that she never passed to the stage of abscess, and that at the time of the accident there was very little evidence of any disease whatever about the joint. When, then, I say in the early stage, I speak relatively. Last spring I assisted my friend, Dr. Poore, of this city, in making an autopsy on a child who died of this disease after a few months' illness. The right hip had become spontaneously dislocated a short time before death, and the doctor and myself found it easily dislocated shortly after the slipping was observed by the nurse. We found the capsular ligament intact, but the ligamentum teres destroyed by ulceration. Dr. Poore has the specimens in his possession, and will publish a full report of the case at no distant date. The conclusion to be drawn, then, is that in the case

<sup>1</sup> On Rest and Pain, N. Y., 1879.

<sup>2</sup> Trans. Am. Med. Assoc., 1859, p. 479.

<sup>3</sup> Loc. cit., p. 479.

<sup>4</sup> Medical Record, vol. xii. p. 253.

I have reported the ligamentum teres must have been destroyed, and the absence of crepitation would seem to limit the disease as yet to the soft parts, and more especially to the ligament. The absence of the "click," too, would aid us in locating the lesion.

One point of interest to the pathologist, and I have done. If hip disease begin, as is claimed by some authorities, in the soft parts within the acetabular cavity, why do we not have more dislocations in the early stage? It certainly cannot be that such accidents are prevented by the early use of mechanical appliances; for, as yet, the major portion of patients suffering with this disease either have no apparatus, or have apparatus so abused in its application that it practically amounts to harm. I report this case as a rare case, and the rarity is due, in my opinion, to the infrequency with which the disease begins in the soft parts. The far greater number of cases of hip disease, I am convinced from observations extending over several years, begin as an osteitis of the head, of the neck, or of the acetabulum.

135 EAST FORTY-SECOND STREET, NEW YORK.

## ARTICLE XII.

A CONTRIBUTION TO THE STUDY OF TRUE ADENOMA OF THE MAMMA. By SAMUEL W. GROSS, A.M., M.D., Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.

UNDER the term adenoma, or some of its synonyms, as *tumeur adénoïde*, *hypertrophie partielle*, *adenocèle*, or mammary glandular tumour, Birkett, Broca, Velpeau, Lebert, Bryant, and Paget have described growths which differ widely in their genesis, intimate nature, and clinical features, and which are composed, for the most part, of the remains of preëxisting lacteal glands contained, but widely separated, in a fibromatous, sarcomatous, or myxomatous stroma. The above names would naturally lead one not familiar with modern histological research to infer that tumours developed at the expense of the secreting structure of the breast are of very frequent occurrence, while the fact is that there is not a single neoplasm of that organ which is so uncommon,<sup>1</sup> and about which so little is known as genuine adenoma. Many noted pathologists have never met with it, and it is very certain that the peculiarities in its life are lost in the writings of the authors that I have mentioned. As I have had an opportunity of examining two specimens, I am induced to lay the results of my investigations

<sup>1</sup> I have seen true adenoma only once out of 115 tumours of the breast, of which I have kept a record, and Billroth (*Chir. Klinik*, Zurich, 1860-67, and Wien, 1869-70) records only one example out of 102 mammary growths.

before the profession, and endeavour, by comparing them with other cases, confirmed by the microscope, to contribute something tangible towards the histology and general pathology of this formation.

The passive mature mamma consists merely of ducts with a few appended small lobules, widely separated from one another in a dense fibrous stroma. During its perfect physiological evolution, such, for example, as is witnessed at the first pregnancy, the glandular structure proliferates, through which there is a partial new growth of acini and ducts throughout the organ, which are contained in a vascular, succulent, loose, and comparatively sparse connective tissue, which is, moreover, rich in cellular elements. Pathologically, a new formation of lacteal glands takes place through a process of budding into the proportionately scant interstitial tissue, so that they preponderate, and represent a simple hyperplasia of the glands as a whole, and not merely of their investing epithelium, as is taught by most authors. A neoplasm which presents a likeness to the mamma of a female advanced in gestation may be styled a typical or pure adenoma, which probably represents the early stage of development of all growths of this class. Their occurrence is, however, so very rare it might be doubted, were it not that Cornil and Ranvier,<sup>1</sup> Waldeyer,<sup>2</sup> Lucke,<sup>3</sup> Foerster,<sup>4</sup> and Wilks and Moxon,<sup>5</sup> refer to tumours in which there seems to be only an excessive production of the glandular apparatus, as the acini, along with their epithelium, preserve their natural form and size and arrangement, are provided with a central lumen, and are contained in a relatively small amount of connective tissue; and this description agrees with that of Deffaix,<sup>6</sup> excepting that he states that the acini are greatly dilated.

In addition to typical, or as it may be termed, hyperplastic adenoma, there is an atypical tumour, which is characterized by changes in the form, dimensions, and grouping of the epithelium of the enlarged and deformed acini, but in which the proper membrane of the latter is preserved, whereby it is distinguished from carcinoma.

CASE I.—Four years ago I removed from the upper and inner circumference of the breast of a prolific married woman, forty-six years of age, a tumour of three years' duration, which was hard, perfectly mobile, bosselated, almost spherical, of the volume of a walnut, and unattended with pain, tenderness, or alterations in the skin, nipple, veins, or axillary glands. On section, the white, but here and there rosaceous white, basis was dotted, but not to any considerable extent, with cavities, none of which were larger than a small pea, which were filled with a yellowish pultaceous or atheromatous material that could be expressed as small plugs. Under the microscope, the greatly enlarged acini were seen to be packed, for the most part, with large, round, angular, elongated and polyhedral cells, which had undergone fatty

<sup>1</sup> Manual d'Hist. Path., vol. i. p. 291.

<sup>2</sup> Virchow's Archiv, vol. xli. p. 516.

<sup>3</sup> Pitha and Billroth's Hdbch. der Allg. und Spec. Chir., Bd. ii. Abth. 1, Heft. 2, p. 280.

<sup>4</sup> Hdbch. der Path. Anat., 2d ed., vol. ii. p. 480.

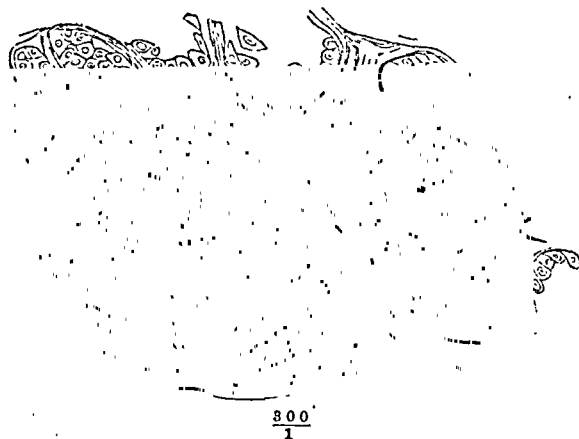
<sup>5</sup> Lect. on Path. Anat., Phila. 1875, p. 583.

<sup>6</sup> Contrib. à l'étude des Tumeurs du Sein d'origine Epithéliale, p. 17.

degeneration in the centre of the largest acini. The connective tissue was present in much less abundance than I have even ever witnessed it in a lactating mamma, and it was in parts the seat of small-celled infiltration. Although the enlargement of the acini was similar to that met with in the secreting breast, the atypical grouping of the large and deformed cells served to distinguish the structure from that of the functionally active mamma, while from the presence of the atheromatous moulds, and the exclusive enlargement of the acini, the tumour is to be classed as a cystic acinous adenoma, the contents of the cavities being due to fatty transformation and caseation of the epithelium.

The neoplasm in question corresponded almost exactly to a hard, lobulated, mobile growth, of twenty-three months' standing, and as large as a child's head, which Billroth extirpated, in 1863, from a prolific female, forty-two years of age. The cut surfaces were more extensively pervaded by atheromatous cysts, but the characters of the epithelium which filled the dilated acini were precisely the same, while the moderately thick inter-acinous connective tissue was slightly infiltrated with small round cells. From its peculiar appearances, Billroth<sup>1</sup> at first called it genuine glandular epithelial sarcoma; and Rindfleisch,<sup>2</sup> who likewise studied its minute features and has represented it in his *Pathological Histology*, Fig. 1, which I introduce in this paper for the purpose of comparing it with the succeeding illustration, regarded it as adenoma or canceroid hypertrophy, and did not

Fig. 1.



object to the name applied to it by Billroth. From this unfortunate nomenclature the term epithelioma is now used for these tumours by Labbé and Coyne,<sup>3</sup> Malassez and Deffaux,<sup>4</sup> and Duplay,<sup>5</sup> although Neumann,<sup>6</sup> Langhans,<sup>7</sup> Cornil and Ranvier,<sup>8</sup> Waldeyer,<sup>9</sup> Klebs,<sup>10</sup> and Lücke<sup>11</sup> adhere to ade-

<sup>1</sup> Hdbch. der Allg. u. Spec. Chir., Bd. 3, Abth. 2, p. 83.

<sup>2</sup> Pathological Hist., p. 537.

<sup>3</sup> Tumeurs Bénignes du Sein, p. 333.

<sup>4</sup> Traité Élémentaire de Pathologie Externe. Par Follin et Duplay, vol. v. p. 632.

<sup>5</sup> Virchow's Archiv, vol. xxiv. p. 326.

<sup>6</sup> Op. cit.

<sup>7</sup> Hdbch. der Path. Anat., p. 1201.

<sup>8</sup> Op. cit.

<sup>9</sup> Ibid., vol. lviii. p. 147.

<sup>10</sup> Ante.

<sup>11</sup> Ante.

noma. Had the French authors not overlooked a subsequent paper in which Billroth<sup>1</sup> gives a more detailed account of his case and calls it cystoid adenoma, this confusion would not have arisen, which is to be regretted, as epithelioma implies the structure of so-called canceroid as met with in other tissues and organs. Even as a generic term, it is most objectionable, unless carcinoma, which is also an epithelioma in the sense of its arising from epithelial elements, be designated atypical, carcinomatous, or infiltrating epithelioma, to distinguish it from adenoma, which would then be regarded as typical, non-carcinomatous, or circumscribed epithelioma. From the fact, however, that the epithelial elements of adenoma may be, and usually are, irregular in their size, form, and arrangement, and thus produce an atypical epithelioma, which differs widely in its structure and life from carcinoma, the term had best be dropped altogether.

As I have just pointed out, adenomas are usually composed of enlarged acini, with aberrations in the characters of their investing epithelium, although they may be constituted mainly of newly-formed ducts. When the acini predominate, they may be termed acinous, while they may be called tubular when the ducts preponderate. Of the fourteen cases of which I have complete accounts, ten were atypical acinous growths, which include three recorded by Labbé and Coyne, two by Fochier,<sup>2</sup> and one, respectively, by Steudener,<sup>3</sup> Neumann, Billroth, Nancrede,<sup>4</sup> and myself, and four were tubular, the latter having occurred in the practice of Billroth,<sup>5</sup> Langhans, and Morton. Hence, it would appear that pure or typical acinous adenomas are very uncommon, that atypical acinous growths constitute the majority, and that the tubular are comparatively rare. Through the kindness of Dr. Longstreth, to whom I am also indebted for its history and gross appearances, I recently had an opportunity of making a minute examination of the specimen of the tubular variety removed by Dr. Morton at the Pennsylvania Hospital, and of which the following is an abstract:—

CASE II.—A spinster, fifty years of age, first noticed, about eighteen years ago, a small tumour of the left breast, which remained stationary for eight years, when it began to increase, and, at the expiration of twelve months, burst and discharged a sanguinolent fluid, after which it entirely disappeared. At the end of four months, another nodule occurred immediately beneath the site of the previous one, which, in its turn, at the expiration of thirty months, opened, and was the seat of a constant slight discharge. About four months before admission, the swelling increased very rapidly, and the discharge became more profuse and more offensive, was occasionally bloody, and caused her to lose flesh and appetite. On admission, there was a moderately soft, and somewhat lobulated, tumour, of the volume of a child's head, dependent from the outer side of the breast, the surface of which was ulcerated, and covered with stinking clotted blood and purulent matter

<sup>1</sup> Langenbeck's Archiv, vol. vii. pp. 860 and 871.

<sup>2</sup> Lyon Médicale, vol. xiv. p. 142.

<sup>3</sup> Virchow's Archiv, vol. xlv. p. 42.

<sup>4</sup> Trans. Path. Soc., Phila., vol. vi. p. 113.

<sup>5</sup> Loc. cit., p. 861.

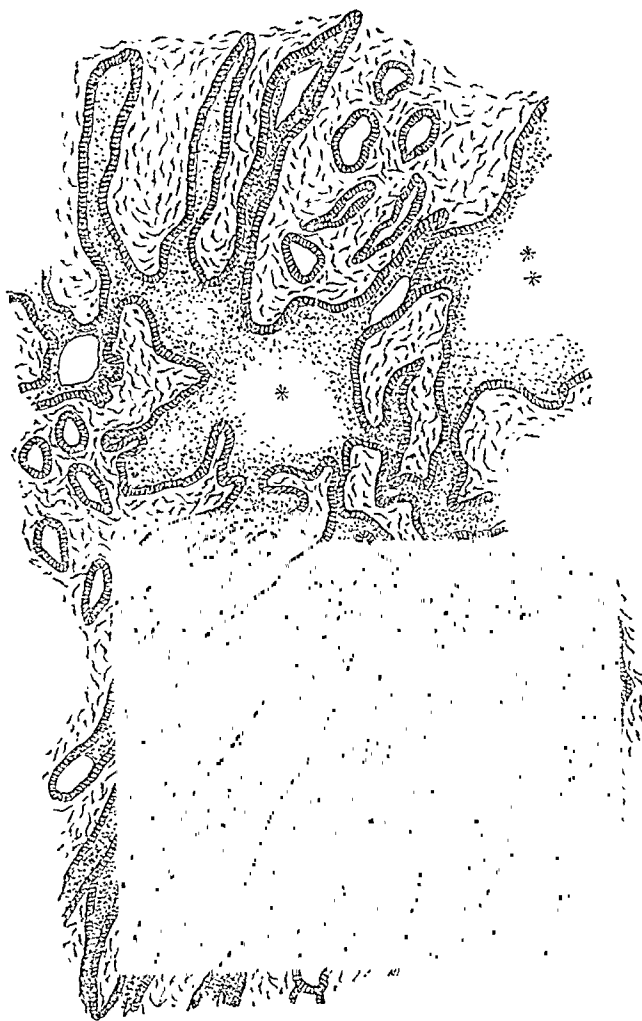
On pressure, a thin sanguinolent fluid was discharged in jets. The lymphatic glands of the axilla and neck were normal. The tumour was removed, and she was well a month subsequently.

The surface of the growth was uneven and nodulated from underlying cysts, which were filled with blood, and the skin towards its base was of a purplish tint. Its diameter was three inches on a level with the chest wall, its height was six inches, and the fungous protrusion had a breadth of six inches. On raising the mass there was a pit deep enough to lodge the tip of the index finger on its inner side, which represented the retracted nipple. On making a section of the tumour tissues of varying appearance were brought into view. The surface was found to consist, in part, of necrosed skin, infiltrated and blackened by blood, and, in part, of crusts of blood. Beneath this were cysts, which varied in size from a pin's head to a walnut, filled with bloody fluid, and possessed of thin and membranous and blood stained walls. In the middle third of the growth the cysts were, as a rule, of larger size, and separated by thick bands of discoloured tissue. In the lower third of the section the tissue was of an opaque white colour, exuded a thin, semitransparent, whitish fluid, and resembled gland tissue, but its consistence was more elastic than that of the normal gland. The undermost peripheral layer of the growth was lobulated, white, and elastic, and separated from the adjacent structures by a thin, shining, fibrous capsule. Several large vessels were seen to penetrate its base, and to course especially towards its outer or fungoid portion.

The entire lower third of the tumour contained, in a vascular, sparse, delicate connective tissue, hyperplastic acini and ducts surrounded by their membrana propria. The acini were deformed, here and there confluent, and measured from five to sixty times their normal diameter. A few were converted into cysts, but the majority were closely packed with cells, the lowermost layer of which was columnar, while the superincumbent layers were round and had undergone fatty changes in the centre of some of the largest acini. In a few there were small vegetations made up of epithelium supported by young connective tissue. In addition to these features, excessively long, although only moderately wide, tubules pervaded the sections to such an extent that they greatly preponderated throughout the entire growth. Some were fusiform in shape, but the majority were irregular in their outline, being alternately contracted and dilated, like a row of ovoid beads. They pursued, as a rule, a parallel course, but they now and then divided and anastomosed with one another, and were not infrequently seen to be in direct communication with the altered acini, of which, indeed, they were merely prolongations, so that I counted nine offshoots from a single acinus, as at \* Fig. 2; for which I am indebted to my friend Dr. Shakespeare. From an adjoining acinus, \*\*, which is only partially represented, five ducts were given off, and one of these united with a duct which originated from acinus \*. They were invested by columnar epithelium, and the majority preserved their lumen throughout, although they frequently terminated in attenuated solid cellular processes, which sometimes were turned upon themselves. The intertubular young connective tissue was so very scanty in quantity that, on transverse section, many of the closely crowded ducts appeared to be separated merely by their adventitia. There were also a few areas of normal dense fibrous tissue, into which the ducts were extending. Sections through the firmer portions of the fungus were so obscured by chronic inflammatory changes that little else was visible save cystic ducts and acini, while cuts through the skin near the ulcer disclosed that it was the seat of an extensive small-celled infiltrate.

From the foregoing minute features of cystic tubular adenoma, those of the case described by Billroth differed mainly in that the dilated acini were closely packed with delicate, partly vascular, connective tissue papillæ or vegetations clothed with cylindrical epithelium, and that from them were given off cellular cords, which looked like thrombosed lymph vessels, but which proved to be embryonic ducts, as indicated by a few being invested

Fig. 2.



$$\frac{100}{1}$$

with columnar epithelium, and possessing a central canal. While in the cases of Morton and Langhans the ducts predominated, it appears that they were only forming and accessory in that of Billroth, as the vegetating cystic acini constituted the essential feature of the neoplasm.

It is thus to be perceived that adenomas may be acinous and tubular, and simple and cystic. Of the typical variety I can find no descriptions,

so that my account has to be drawn from fourteen cases, every one of which was cystic, eight having been the seat of atheromatous cysts, and six of ordinary fluid cysts, while, in addition, three of the entire number were characterized by microscopic intraacinous vegetations.

The contents of the cysts may be fluid or semifluid, and are due to changes which take place in the proliferous epithelium. In the former event the secretion may be lactescent, as in the cases of Nancrede and Neumann; or sanguinolent, from the presence of vascular vegetations, as in one of the cases recorded by Labbé and Coyne;<sup>1</sup> or even without there being any very large vegetations, as in the example of Morton. When the cells have undergone advanced fatty changes, the contents are of a rather dense caseous nature, but the cavities are usually minute and never attain the volume of a walnut, as occurs when the contents are fluid. The size of the spaces rarely, indeed, exceeds that of a hazelnut; and the larger ones are usually formed by the confluence, or breaking down, of contiguous ones. When the cysts are vegetating, the lining epithelium proliferates in the form of papillæ, which may be purely epithelial in their composition when they are small, or are made up of delicate vascular connective tissue, clad with columnar epithelium, when they fill the acini, as in the case of Billroth.

With the exception of cystic changes, adenoma does not appear to undergo other transformations, unless it be the telangiectatic, of which the case of Morton is a good illustration; or the myxomatous, as in a case of adenoma of the male mamma, recorded by Obolensky.<sup>2</sup> It is, moreover, not very liable to spontaneous ulceration, as that accident was only met with in the cases of Morton and Fochier; although it was threatened in one recorded by Labbé and Coyne.<sup>3</sup> In another example, under the care of the latter observers,<sup>4</sup> the tumour inflamed, ulcerated, and protruded fungous vegetations as a result of injections of phenic acid.

Adenomas are usually ovoid and invariably bosselated or nodulated in outline, but not largely so, and of a hard resistant consistence, although, when decidedly cystic, they may be uniformly soft and elastic, or, as more often happens, hard, excepting at the larger bosses over which they fluctuate. Although they are limited by a distinct fibrous capsule, they are, when of moderate volume, closely and broadly united to or incorporated with the mamma; but their attachment is less conspicuous as they increase in bulk. On section the cut surfaces are smooth, lobed, of a milky-white colour, with possibly rosaceous areas, and dotted with orifices or small cavities, which, after their contents have been expressed, impart to them a spongy, honeycomb, or sieve-like appearance. Now and then they are occupied by fluid cysts, which, however, rarely number more than three

<sup>1</sup> Op. cit., p. 343.

<sup>2</sup> Virchow-Hirsch's Jahresbericht, vol. i. p. 305.

<sup>3</sup> Op. cit., p. 356.

<sup>4</sup> Ibid., p. 352.



or four, are usually quite small, and rarely exceed the volume of a walnut. Their cut surfaces are never pervaded by fissures or slits, nor are they the seat of dilated ducts with intracanalicular solid growths, as are witnessed in the connective tissue neoplasms; nor of yellowish lines or spots, such as are seen in carcinoma.

They are never multiple, and originate usually toward the upper and inner periphery of the breast, being found either beneath or in the vicinity of the nipple in only one-third of all instances. They develop as early as the nineteenth and as late as the fifty-ninth year, the average age of their first observation being thirty-five years. Of the fourteen examples

1 appeared between 10 and 20 years.					
3	"	"	20	"	30
5	"	"	30	"	40
4	"	"	40	"	50
1	"	"	50	"	60

Of the entire number not a single one occurred before the sixteenth year, or during the developmental state of the mamma; six, or 42.85 per cent. appeared previous to the thirty-fifth year, or during the period of the functional activity of the breast; and eight, or 57.14 per cent., after that age, or during the functional decline of the mamma.

Nine of the patients were married when the tumour was first detected; two were single, and in three the social condition was not stated. Of the married women, five were prolific, two had one child, and one was barren; and the question of children was not mentioned in one. In none did the tumour originate during lactation. The menstrual discharge was regular in all the cases in which that function was noted. In not a single instance was the disease traceable to injury or hereditary influence; but in one<sup>1</sup> it was preceded by eczema of, and a milky discharge by, the nipple, on the removal of the crusts, which had, however, ceased for nine years, and in another by mammary abscess.<sup>2</sup> The general health of the subjects was excellent.

The increase of adenomas is, upon the whole, less rapid than that of any other of the neoplasms of the breast, and is not influenced by lactation, pregnancy, or uterine disorders. In the case under my own care the tumour attained the volume of a walnut in three years. In one recorded by Langhans,<sup>3</sup> it reached a size which equalled the palm of a hand in nine years, although it may grow as large as a hen's egg in six<sup>4</sup> or twelve months.<sup>5</sup> Certain writers state that it does not exceed the latter volume, but it may reach the dimensions of a fist in two,<sup>6</sup> fifteen,<sup>7</sup> or thirty-six years,<sup>8</sup> or of a

<sup>1</sup> Labbé et Coyne, op. cit., p. 356.

<sup>2</sup> Case of Nancrede.

<sup>3</sup> Virchow's Archiv, vol. lviii. p. 147.

<sup>4</sup> Labbé et Coyne, loc. cit.

<sup>5</sup> Billroth, Langenbeck's Archiv, vol. vii. p. 861.

<sup>6</sup> Case of Neumann.

<sup>7</sup> Labbé et Coyne, op. cit., p. 352.

<sup>8</sup> Ibid., p. 343.

child's head in ten months,<sup>1</sup> twenty-three months<sup>2</sup> or eighteen years.<sup>3</sup> Hence the rate of growth is very variable, but the mode of growth is peculiar in being equable and uninterrupted, and, as a rule, so slow that many years may elapse before the tumour attains even a moderate bulk. Thus in the cases of Morton, and in one of Labbé's, it was scarcely appreciable for respectively seven and ten years, while in another of Labbé's, the increase was so excessively slow that the almond-sized nodule required thirty-three years to reach the volume of an egg, after which it took a more rapid growth so that in three years it equalled the dimensions of a fist. The mode of increase appears also to be singular in that it goes on by the apposition of new nodules to the original tubers, which is due to the successive involvement of contiguous lobules, through which the entire mamma may finally be converted into a bosselated tumour.

After they have existed for some time, they evince certain signs, which, if they are not carefully studied, render them liable to be confounded with carcinoma. Although the subcutaneous veins are prominent in only one case out of every twelve,<sup>4</sup> the skin is discoloured in one out of every three, and it is adherent in one out of every two. The nipple is deformed or sunken, rather than retracted, in one example out of every six, and a bloody or lactescent discharge by that body precedes the detection of the tumour in one case out of every four. Ulceration occurs late in the disease in one instance out of every three, and in one-half of these a red, vegetating, and bleeding fungus protrudes through, but is unattached to the margins of, the opening, and may be cast off piecemeal. In the remaining half there is merely a sanious, and, possibly, a fetid discharge. Caseous degeneration or enlargement from irritative hyperplasia of the axillary lymphatic glands is met with in one case out of every six. In 63.63 per cent. of all instances there is absolute freedom from pain; in 9 per cent. the suffering is moderate, while in 27.27 per cent. the pain is severe and lancinating, especially when the growth has been rapid.

Our knowledge of the prognosis of adenomas is unsatisfactory. In one of Fochier's patients, the parts were perfectly sound six months after operation. One patient remained well for two years after the enucleation of a tubular adenoma, but there were several large and hard lobules in the vicinity of the cicatrice.<sup>5</sup> In one of Labbé's cases<sup>6</sup> there was local recurrence and enlargement of the axillary glands in less than twelve months, and death ensued at the expiration of three years after the removal of the entire breast, but there does not appear to have been a post-mortem inspection of the body. The disease recurred in the cicatrice in seven

<sup>1</sup> Case of Fochier.

<sup>2</sup> Billroth, *Langenbeck's Archiv*, vol. vii. p. 860.

<sup>3</sup> Case of Morton.

<sup>4</sup> The histories are complete in only twelve cases.

<sup>5</sup> *Langenbeck's Archiv*, vol. vii. p. 861, and *Chir. Klinik*, Zurich, p. 256.

<sup>6</sup> *Op. cit.* 352.

months after total extirpation of the mamma of the patient of Steudener, but she was well thirty-one months after its removal. Of the remaining ten, two are entirely devoid of a history of the termination, while five recovered from operation, and three died, one of lung complications, one of erysipelas, and one of septicæmia. Duplay<sup>1</sup> and Deffaux<sup>2</sup> state that adenomas frequently recur, and the cases in which the histories extend over a sufficiently long period after operation demonstrate that recurrence is the rule. They exhibit no tendency, however, to infect distant organs, and their benign nature is shown by the fact that they had existed, on an average, nine years before extirpation, without affecting the general health. One case, indeed, was of nine, one of fifteen, one of eighteen, and one of thirty-six years' standing.

A small adenoma is very liable to be mistaken for a small fibroma, but the latter is more distinctly circumscribed and isolable, and far more mobile in or upon the mamma, and its outline is not so decidedly bosselated. Upon the whole, the diagnosis of adenoma is based upon its hard and heavy feel, its nodular configuration, its pretty intimate attachment to the breast when of moderate volume, its slow and equable growth, its increase by the addition of small, compact nodules, its occurrence in married women towards the thirty-fifth year, the limited discoloration and adhesion of the skin and ulceration late in the disease, and freedom from retraction of the nipple, enlargement of the subcutaneous veins, attachment to the chest, and involvement of the lymphatic glands. If a tumour, which presents these features has been preceded by a discharge by the nipple, there should be little difficulty in arriving at a correct conclusion as to its true nature.

PHILA., 1112 WALNUT ST., August, 1879.

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### ARTICLE XIII.

A CASE OF RUPTURED WOMB, FOLLOWED BY ABSCESS, AND ULTIMATE RECOVERY. By B. M. BADGER, M.D., of Wright's Bluff, South Carolina.

THE subject of this accident, Mehinia R., is a stout negress, aged 32 or 34; eleventh pregnancy. I was called to see her at 10 o'clock A. M., April 11, 1879; labour had been in progress about forty hours. Her condition at the time of my arrival was one of extreme exhaustion, pulse weak and frequent, facies anxious. She had been vomiting for some time, the matters discharged, however, were only the gastric ingesta.

The whole appearance of the woman was one of great physical suffering. She complained of severe abdominal pain, referred more especially to the epigastrium; this localization of her pains being very marked and distressing.

<sup>1</sup> Op. cit., p. 633.

<sup>2</sup> Op. cit., p. 40.

A hasty and superficial examination of the abdomen revealed a very prominent tumour occupying the hypogastrium; furthermore a vaginal examination revealed a case of shoulder presentation, with protrusion of right hand and arm livid and much swollen.

The woman was nearly moribund, but I appreciated the fact that there was not a moment to lose, and I determined to do the best I could, unaided as I was, although an apparently hopeless task was before me.

Having chloroformed the patient, I proceeded at once to introduce my hand, grasp the feet, turn, and deliver, which was accomplished with much less difficulty than I have at other times encountered in cases of shoulder presentation. The child was dead, and had, to all appearances, been so for several hours.

It may here be remarked, parenthetically, that up to this time there had nothing transpired to lead me to *know* that I had a case of ruptured womb to deal with, as, upon my arrival, recognizing the imperative necessity for immediate interference, I did not lose any time in prosecuting an investigation that could only have resulted in a criminal delay, and besides there had as yet been presented no unequivocal signs of such a catastrophe.

After resting a few moments, the woman in the mean while having rallied from the effects of the anæsthetic, I introduced the hand to bring down the placenta; my fingers came in contact with the mouth of the womb, but neither funis nor placenta was discoverable within. The horrible withering truth now instantly flashed upon me; and it was but an act of intuition to grasp with the other hand the hypogastric tumour, and discover, by conjoined manipulation, that I held between the two a firmly contracted empty womb. I withdrew the hand, and, seizing the cord, following it as a guide through the rent, discovered the placenta somewhere in the vicinity of the stomach: the hand before reaching the object of its pursuit, coming in contact with the mesenteric folds, small intestines, etc., which were pushed aside.

The rent was so large as to occasion no appreciable constriction, and seemed nearly to sever the neck from the body of the womb, occupying the entire front of the cervico-corporeal juncture. The hemorrhage (external) was insignificant, nothing to compare to ordinary cases of natural labour, a fact which much puzzled the two midwives present, from whom I elicited the following: That about nine o'clock the day before, while the woman was endeavouring to relieve her bladder, there was a sudden gush of water (amniotic) preceded immediately by a sensation as if something had burst, and so distinct was this impression that the woman insisted that the child had escaped into the chamber vessel on which she was then sitting; upon being assisted to bed, it was discovered that an arm of the child had presented. Repeated, but futile, efforts were made to restore the arm, vainly temporizing, hoping, we suppose, for spontaneous evolution, or, as they expressed it, that "things would come right after a while." The result was a criminal delay of twenty-four hours.

The binder applied, she was put to bed, feeling as comfortable as could have been expected; her friends being informed as to the serious nature of the case, and utter unlikelihood of her recovery.

Large doses of opium given to relieve the severe and persistent epigastric pain, and continued *pro re nata*, to restrain all peristalsis.

16th, five days after delivery ; stomach irritable, abdomen enormously tympanitic, and very tender on pressure ; skin hot ; pulse 130 ; vaginal discharge very scanty ; bowels moved once by an enema ; bladder emptied spontaneously ; patient conscious, but anxious and extremely restless.

Opium continued as before, in conjunction with turpentine stupes, it also being administered internally ; diet as nourishing as possible.

From this date there was a slow but steady amelioration of all symptoms, and, on the 23d, the patient was bright and cheerful. Skin moist and cool ; pulse 116 ; abdomen much reduced, some tenderness on pressure. I here discovered that there was some induration just below the umbilicus. Very little change in treatment. Whiskey and milk-punch ordered.

The tumour-like hardness below the navel for several days continued to occasion great and increased suffering, and, as there was now no doubt as to its nature, poultices were applied, and, on May 5th, a large abscess had pointed just two inches below the umbilicus. Plunging a bistoury into this, and enlarging the opening to about an inch as I withdrew it, there escaped about sixty-four ounces of horribly offensive pus. From this time her improvement was uninterrupted, and, on the 19th, I found her doing some light work in the garden.

*June 5.* Made an examination ; the orifice of the abscess entirely closed. A distinct band of adhesion (the nidus of the old abscess) running from this point to the fundus of the womb, which, through the flaccid walls of the abdomen, can be felt about two inches in diameter and three or four in length ; it allows rough handling, and so firmly adherent to the womb as to convey the idea of an elongation of that viscus ; and, grasping which with the left hand, and using it as a lever, I was greatly aided in bringing the os within the speculum.

There appeared to be no other adhesions, as the womb was extremely mobile otherwise. A good light enabled me to see that the rent had entirely healed ; effectually and to all appearances hermetically closing the mouth of the womb. I did not attempt to introduce a probe, but am disposed to regard the os as being impervious, inasmuch as the woman states that her menses usually returned within six weeks from the birth of a dead child, and up to this writing, June 24th, she has seen no signs whatever.

## REVIEWS.

ART. XIV.—*National Public Health Legislation.*

1. *Reports and Resolutions relating to Sanitary Legislation. Presented to the American Public Health Association at its meeting in Richmond, Va., November, 1878.* 8vo. pp. 23. Cambridge, 1878.
2. *A Bill to Establish a Department of Public Health*, offered by Mr. LAMAR, Dec. 10, 1878 (S. 1462), 45th Congress, 3d session.
3. *Memorandum of the American Public Health Association on Legislation Affecting Public Health.*
4. *Proceedings of the Board of Experts authorized by Congress to investigate the Yellow Fever Epidemic of 1878, meeting held in Memphis, Tenn., Dec. 26, 27, 28, 1878.* 8vo. pp. 21. New Orleans, 1878.
5. *Circulars of the National Board of Health, Washington, D. C.* 8vo., Nos. 1, 2, and 3. April 7, 1879.
6. *National Board of Health Bulletin.* Nos. 1-7, 1879.

TITLE LVIII. of the Revised Statutes of the United States, issued in 1875, is headed "The Public Health," and contains nine sections. The first of these directs that State quarantine and other health laws shall be observed by officers of the revenue and military services of the United States. It would seem that naval officers are not under such obligation, and it is difficult to conceive of any good reason for this exception.

The next four sections relate to details of custom-house work in connection with State quarantine establishments, the most important one being the following:—

"There shall be purchased or erected under the orders of the President, suitable warehouses, with wharves and inclosures, where merchandise may be unladen and deposited from any vessel which shall be subject to a quarantine, or other restraint, pursuant to the health laws of any State, at such convenient places therein as the safety of the public revenue and the observance of such health laws may require." (Sec. 4794.)

The remaining sections relate to the removal of revenue officers from ports, and of public offices from the capitol, the adjournment of courts, and the removal of prisoners, in case of the prevalence of a contagious or epidemic disease.

Evidently Congress had given very little attention to the public health prior to 1875. It should be noted, however, that in the winter of 1873-4, a strong effort was made in Congress to pass a quarantine act at the instance of Mr. Bromberg, representative from Alabama, and the discussion of the subject which then occurred, no doubt had much value as an educational measure. Within the last year a marked change has occurred in the situation, and the purpose of this article is to give an account of this change, and to furnish data for an intelligent opinion upon a question which has been indirectly submitted by Congress to the medical profession

and sanitarians of the United States for decision, viz., What is the best plan for a national public health organization including a national system of quarantine?

Just at the close of the yellow fever epidemic of 1878, came the meeting of the American Public Health Association, at Richmond, Nov. 19-22. To this meeting came all the leading and professional sanitarians of the country, and also many physicians and laymen who had been in the midst of the epidemic and could present the most vivid pictures of the desolation and suffering which it had caused.

It was supposed that the report of the Yellow Fever Commission would be presented at this meeting, and that the Association, after due deliberation, would give an opinion as to what should be done, but it was found that the report was not ready, and, indeed, it was unreasonable to suppose that it could have been prepared in the time allowed.

The Association therefore had before it little or no evidence as to the nature of the cause of yellow fever, and it adopted certain propositions, not as deliberate and final conclusions, but as merely indicating the prevailing opinion of those present.

These propositions were as follows:—

1. Yellow fever is a specific disease, and its appearance in the United States in 1878 was due to the importation of the specific cause.

2. Quarantine established with such rigor and precision as to produce absolute non-intercourse, will prevent the importation of the specific cause of yellow fever.

3. It is the duty of the General Government to aid in the establishment of a practical and proper quarantine by all means in its power.

4. It is the duty of the General Government to appoint a commission of experts to make a thorough investigation into the causes of yellow fever, and the best methods of preventing its introduction into this country, and to make such an appropriation as will permit of securing the services of the best men and of the best means for carrying out such investigation.

5. It is the duty of the General Government to invite foreign nations to co-operate with it in the establishment of uniform and effective international quarantine regulations.

6. Whatever may be the practical value of quarantine, there is no doubt of the importance and value of internal sanitary measures in the prevention or modification of epidemic yellow fever, and this Association strongly urges upon State and municipal authorities the great amount of responsibility which rests upon them on this account at times when no disease is prevalent or threatening.

Although these resolutions met with some objection and criticism from both the medical and secular press, they represent very fairly the prevailing public opinion of the time, and the influence of this opinion was at once apparent on the meeting of Congress in the following December. Special Committees on Epidemic Diseases were at once formed in both House and Senate, and the fact that such committees were found necessary is sufficient evidence of the slight degree of attention which had previously been given to the subject of public health by Congress, there being no standing committee to which such questions as were now of prime interest could with propriety be referred. Upon the recommendation of these committees a commission composed of members and senators assisted by twelve experts was formed, and proceeded to visit Memphis, New Orleans, and other points at which the disease had prevailed, and collect

the opinions of physicians in those cities as to the nature and cause of yellow fever, and as to what should be done by Congress in the premises.

Several bills were also introduced without waiting for the report of the commission, of which bills, the one presented in the Senate by Mr. Lamar, of Mississippi, on Dec. 10, 1878, attracted most attention and roused a strong opposition.

This bill created a Department of Public Health with a Director-General at its head, who was to perform also the duties of the Supervising Surgeon-General of the Marine Hospital Service, or, in other words, it converted the Marine Hospital Service into a department of public health for the United States.<sup>1</sup>

The duties of the Director-General of Health were defined to be as follows, viz., to make and enforce all quarantine and other regulations for the prevention of cholera or yellow fever and other epidemic diseases in the United States, and whenever cholera or yellow fever might appear in any locality, and information thereof should be brought to the knowledge of said officer, he was to prepare and carry into effect such rules and regulations as in his judgment would, with the least inconvenience to commerce and travel, prevent the spread of the disease.

He was to select suitable localities for establishing quarantine stations, erect buildings and enforce such transshipment of passengers, baggage, and cargoes, as he might deem necessary. The Director-General was also to do divers and sundry other things, but the autocratic power sought to be conferred on the Supervising Surgeon of the Marine Hospital Service, by the clauses just referred to, was very distasteful to the leading sanitarians of the country, and especially to those connected with State and Municipal Boards of Health. The views of these gentlemen were expressed in the action taken by the executive and advisory committees of the American Public Health Association, and published in January, 1879.<sup>2</sup> This memorandum set forth:—

“That in view of the great diversity of opinion among those who attempt to judge as to methods of quarantine, and especially as to the relations which should exist between national and local systems of quarantine; of the fact that we have not as yet sufficient information to enable us to formulate any system of national quarantine which might not do more harm than good; and of our belief that there is a possibility of recurrence of yellow fever in the United States during the coming summer from causes which may have survived from last summer, and which, therefore, cannot be prevented by any system of national quarantine alone; we believe that any legislation, until further investigation has been made with regard to a national quarantine, either to provide a new law or to amend or enforce the present one, will be inexpedient and unwise.”

The memorandum then goes on to advise the organization of a provisional National Health Commission, which should be in no manner dependent upon or be connected with any existing bureau or department of the government. Omitting, for the present, further summary of this memorandum, which is a very important document in the history of public

<sup>1</sup> The Marine Hospital Service has no connection with the Navy Department as the name might seem to imply; it is a branch of the Treasury Department established to care for sick seamen of American vessels engaged in commerce, including steamboat hands in the interior waters. The funds for doing this are derived from a tax on each seaman of fifty cents per month, which is levied by the United States Collectors of Customs, and it is for this reason that the business is under the control of the Treasury Department.

<sup>2</sup> Memorandum of the American Public Health Association on legislation affecting the public health. 4 pp. 8vo.



health legislation in this country, we merely note that strong objection was made by some physicians in the South to the statement as to the possibility of recurrence of the disease from causes already in the country, but the result has fully proved the wisdom of the warning.

In the meantime the Board of Experts appointed by Congress had visited the South and taken testimony, and at the end of January, 1879, presented its conclusions to Congress. These conclusions, so far as they related to legislation, may be summed up as recommending the following provisions:—

1st. The formation of a chief health authority at Washington.

2d. Stationing medical officers at foreign ports to report as to condition of vessels bound for the United States.

3d. Establishment of quarantine.

4th. Local sanitation, isolation, etc.

Having received this report, the Senate Committee on Epidemics, on February 7, 1879, submitted through its chairman, Senator Harris, of Tennessee, a bill to prevent the introduction of contagious or infectious diseases into the United States, and to establish a Bureau of Public Health. This bill was narrower in its scope than the Lamar bill, since it created a Board of Health which had no duties other than those relating to quarantine, and it retained the feature of making the Marine Hospital Service the Bureau of Public Health.

The opposition to this was nearly as strong as to the Lamar bill, and, indeed, stronger on the part of sanitarians, since it reduced the question of the public health to a mere matter of quarantine, and entirely ignored questions of municipal cleanliness.

The bill passed the Senate, however, but failed to pass the House. In lieu of it, in the last hours of the session, a bill, introduced by Mr. McGowan, of Michigan, passed the House and Senate, and was approved March 3d, 1879, under the title of "An Act to prevent the introduction of infectious and contagious diseases into the United States, and to establish a National Board of Health." This we shall in future speak of as the Constituting Act.

This Act may be considered as the true beginning of National Public Health Legislation in the United States, and as being the foundation upon which we are to build; and the preceding account of some of the circumstances and influences which led to its passage has been given to enable the reader to rightly appreciate certain crudities and imperfections in the Act, and also that he may understand the strong differences of opinion as to its merits.

It was hastily drawn, and passed in the last hours of the session, without discussion, as being the best that could be done at that time; and under such circumstances it is surprising that its provisions should be so generally satisfactory as they have proved to be.

It creates a National Board of Health to consist of seven members to be appointed by the President, and of one medical officer of the Army, one medical officer of the Navy, one medical officer of the Marine-Hospital Service, and one officer of the Department of Justice, to be detailed by the chiefs of their respective departments.

The Board is to frame its own rules and regulations, and select its own officers, and its duties are defined to be:—

"To obtain information upon all matters affecting the public health, to advise the several departments of the Government, the executives of the several States, and the commissioners of the District of Columbia, on all questions submitted by

them, or whenever in the opinion of the Board such advice may tend to the preservation and improvement of the public health."

It is also directed to 'consult with the Academy of Sciences and with the principal sanitary organizations and the sanitarians of the States and the United States, and after such consultation to report a plan for a National Public Health Organization.

Owing to delay in the appointments, the Board was not organized until April 2d, 1879. In the mean time an extra session of Congress had been convened on the 18th of March, and a bill for a National Quarantine had been introduced, which in many respects was identical with the one introduced by Senator Harris during the previous session as above referred to.

As soon as the National Board of Health was fairly organized this bill was referred to it for comment, and was returned by it with suggestions as to additions and alterations which were only in part accepted by Congress. This was to be expected, since the views of physicians and sanitarians are by no means taken from the same standpoint as those of lawyers and legislators.

The feeling of the Board, as shown in its communication to the Committee, was averse to assuming any special authority over quarantine matters, if for no other reason than that it had not yet obtained the necessary information to enable it to act promptly and decidedly.

On the other hand, the representatives of constituencies in the Southwest, which had suffered from the epidemic of the previous year, were very strongly impressed with the inefficiency of State and local quarantine measures, and with the desirability of having some central power which should make quarantine uniform and efficient.

The ground taken by those specially in charge of the bill was that Congress could legislate on public health only through its power to regulate commerce, and therefore that its legislation must be confined to quarantine. The result was the passage of the Act approved June 2d, 1879, which we may entitle the Quarantine Act.

It was by no means easy at first to understand what duties and powers were actually conferred on the National Board of Health by this Act. Probably the great majority of the people, and indeed of Congress, supposed that it gave the National Board very great powers of interference with State and local organizations so far as quarantine is concerned; that the Board could stop boats or trains, depopulate towns, arrest persons defying its authority, etc. etc. Many persons also supposed that it empowered the Board to make rules and regulations by which State and municipal boards should be governed.

The truth is that the only power given to the Board, so far as interference with State and local boards is concerned, is given by the following paragraph of the law, viz:—

"SEC. 3. That the National Board of Health shall co-operate with and, so far as it lawfully may, aid State and municipal boards of health in the execution and enforcement of the rules and regulations of such boards to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, and into one State from another; and at such ports and places within the United States as have no quarantine regulations under State authority where such regulations are, in the opinion of the National Board of Health, necessary to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, or into one State from another; and at such ports and places within the United States where quarantine regulations exist under the authority of the State, which, in the opinion of the National Board of Health, are

not sufficient to prevent the introduction of such diseases into the United States, or into one State from another, the National Board of Health shall report the facts to the President of the United States, who shall, if, in his judgment, it is necessary and proper, order said Board of Health to make such additional rules and regulations as are necessary to prevent the introduction of such diseases into the United States from foreign countries, or into one State from another, which, when so made and approved by the President, shall be promulgated by the National Board of Health and enforced by the sanitary authorities of the States, where the State authorities will undertake to execute and enforce them; but if the State authorities shall fail or refuse to enforce said rules and regulations the President may detail an officer or appoint a proper person for that purpose.

"The Board of Health shall make such rules and regulations as are authorized by the laws of the United States and necessary to be observed by vessels at the port of departure and on the voyage where such vessels sail from any foreign port or place at which contagious or infectious disease exists, to any port or place in the United States, to secure the best sanitary condition of such vessel, her cargo, passengers, and crew, and when said rules and regulations have been approved by the President they shall be published and communicated to, and enforced by, the consular officers of the United States; *Provided*, That none of the penalties herein imposed shall attach to any vessel or any owner or officer thereof, till the act and the rules and regulations made in pursuance thereof shall have been officially promulgated for at least ten days in the port from which said vessel sailed."

The only rules and regulations which the Board could make, therefore, were those to be observed by vessels at foreign ports of departure where contagious or infectious disease exists, or on the voyage from such ports.

Under these circumstances the Board called into its counsels the quarantine officers of some of the principal seaports of the country, and in accordance with their suggestions, and more especially those of Dr. S. O. Vanderpoel, the quarantine officer of the port of New York, prepared a set of rules and regulations for securing the best sanitary condition of vessels, including their cargoes, passengers, and crews, coming to the United States from any foreign port where any contagious or infectious disease might exist.

These regulations were approved by the President on the 26th of June, 1879. Under these rules the following diseases are recognized as contagious or infectious: Asiatic cholera, yellow fever, plague, smallpox, and typhus fever; and an infected port or place, in the sense of the rules, is a port or place at which either Asiatic cholera, yellow fever, or plague exists, or at which either smallpox or typhus fever exists as an epidemic.

These rules and regulations in the main accord with those reported by the Special Committee on Quarantine to the Fourth National Sanitary and Quarantine Convention, which met in Boston in 1860, which in their turn were copied from the regulations for quarantine adopted in the convention between France, Sardinia, and certain of the Mediterranean powers, and issued in 1853.

Besides these rules and regulations, properly so called, the Board issued a circular to State and municipal health authorities, containing recommendations for "Rules and Regulations to be adopted and observed at all ports in the United States, which are or may be designated as quarantine stations," and also to secure the best sanitary condition of steamboats and other vessels going from any port of the United States where yellow fever exists to any other port or ports in the United States, and to secure the best sanitary condition of railroads, including their station-houses, etc., connecting with any port where yellow fever exists; also regulations to be observed and enforced by the health authorities of a place free from infection but having communication with a place dangerously infected with yellow fever, and those to be adopted in the infected town or place itself.

The rules and regulations recommended in this circular are often spoken of as the Rules and Regulations of the National Board of Health, but they are not really rules and regulations, in the legal sense of the word, until they have been adopted by some body which has the power to enforce them, such as a State or city, in which case they become the rules and regulations of the enforcing body.

These recommendations had just been agreed upon, and the printing of them had not been fairly completed, when an outbreak of yellow fever in Memphis was announced on the 9th of July, which was soon followed by a similar announcement from New Orleans.

Under this stimulus the State and local boards of the southwest, as a rule, accepted the recommendations of the National Board with great promptness, and set to work to limit, if possible, the spread of the disease. The time between the passage of the law and the outbreak in Memphis was much too short to permit of any satisfactory organization. The condition of Memphis itself was very peculiar; it had given up its charter as a city, and was changed into a county taxing district, which was in the hands of two receivers, the one State and the other national. A special commissioner was appointed by the State for the government of the taxing district, and a tax law was passed permitting the collection of funds for certain specific purposes only, and in very limited amounts.

This act did not take effect until so late in the season that the local authorities were unable to obtain means with which to put the city in a good sanitary condition, or to accumulate materials for use in case of the outbreak of an epidemic.

Through the exertions of a voluntary association of citizens of Memphis the streets and alleys had been made reasonably clean, that is, so far as this could be done without removing the great quantity of rotten wooden pavement which exists in that city; but nothing was done to change the privy system, which is one of pits, emptied at irregular intervals and without method, the pits varying in depth from six to twenty-five feet. The result was that the outbreak of the disease found Memphis totally unprepared to meet it; the more so as it had been hoped that the preceding unusually severe winter had destroyed all germs of the disease existing in the city, and that its only danger would be from a fresh importation. Some confusion and delay occurred from the failure of the State and local boards to appreciate the fact that the main part of the work to be done depended on themselves, and not on the National Board; and some delay also occurred on the part of the Treasury Department, as to the proper mode of construction of the law, and as to its duty in approving the estimates and requisitions forwarded by the Board; but the conclusion of one of its prominent officials, that although all this must be considered as sentimental legislation and a waste of money it would, nevertheless, be as well not to oppose it, finally prevailed.

It is not the purpose of this paper to record the operations of the Board, or the progress of yellow fever during the summer of 1879. All this will be found duly set forth in the Bulletin, a weekly publication of the Board, authorized by law, the first number of which was issued June 28, 1879.

The questions to be answered during the autumn and coming winter by physicians and sanitarians, by the National Board, by the Academy of Sciences, and by Congress are:—

1st. Is the present constitution of, and legislation affecting, the National Board of Health satisfactory?

2d. If it be not satisfactory, what changes should be made? since, with the readers of this Journal, we may assume without argument the desirability of a National Public Health organization of some sort.

The principal difficulties which have been met with by the Board in the outset of its career, giving rise to some rather bitter criticisms on the part of the public press, appear to have been due to several causes. The first is the difficulty in moving promptly and decidedly which a board almost always evinces as compared with an individual. A board is rarely unanimous at first; it discusses, and doubts, and hesitates, and thus sometimes loses the golden opportunity.

The second difficulty is, that the great body of the public has taken comparatively little interest in the National Board or in public hygiene, and is in almost total ignorance of the whole subject.

The general impression in many quarters was, at first, that the Board was created to prevent the occurrence of yellow fever in the United States; that it had been given ample powers and means to do this, and if yellow fever broke out—as it did—it proved the inability and inefficiency of the Board. The feeling of many persons was expressed in the query of a prominent official who demanded loudly, “Why don’t the Board proceed at once to Memphis, and take the fell destroyer by the throat?”

While skilled sanitarians will smile at the ignorance betrayed by this question, it must be remembered that such a man represents a very large constituency, and until he, and those like him, are better informed about the possibilities of public hygiene, and the methods which should be used to prevent disease, no National Public Health organization can be said to rest on a secure and permanent foundation. Many physicians, even, cannot see why the Board did not do something striking, and calculated to meet the popular demand. Why, for instance, it did not cause each case of yellow fever to be isolated thoroughly, all infected clothing, bedding, and buildings to be destroyed, or satisfactorily disinfected, and all persons liable to the disease in an infected town compelled to move into a camp of observation, etc. It may be worth while to comment a little on these points.

In the first place, the earlier cases of disease will not usually be made known to the Board. In many cases they will not even be recognized by the physicians who see them, for it is extremely difficult sometimes to distinguish a case of yellow fever, but, even when they are recognized, the local influences are all against their being reported. He is a bold physician who, in New Orleans, would report publicly a case of yellow fever in June or during the first half of July, and he may be sure that his diagnosis will be promptly contested.

In the second place, the National Board of Health had no power to isolate or disinfect, or to remove people from their homes; even States and cities have this power to but a limited degree, and must pay for all damages caused by its exercise. But the National Board has no such power, and had it tried to assume it it would almost at once have found itself in conflict with State and municipal laws, and have aroused the hostility of State and municipal health authorities, the very organizations with which it was of the utmost importance it should be on friendly terms in order to satisfactorily render the aid and co-operation prescribed by the law.

The only powers possessed by the National Board lay, first, in the character and reputation of its members, and the probability that their

advice would be received with respect by local organizations ; and, second, in the fact that \$500,000 had been given to it by Congress to enable it to aid and co-operate with such authorities, and that the desire of States and cities to obtain a portion of this money would induce them to consult the wishes of the Board independent of any weight which they might give to its advice as coming from a body of scientific men.

One of the first questions to be settled is as to whether it is desirable that the National Public Health Organization should possess any more power, in the legal sense of the term, than it has now.

Setting aside all questions connected with the constitutionality of giving it authority to interfere with State or municipal authorities, or with travel and traffic, and supposing it were perfectly legitimate to give it power to close a port or to isolate a house, would it be expedient to do so? Is it not best for the cause of preventive medicine that our National Public Health Organization shall for the present be mainly concerned with collecting information, giving advice, and stimulating the work of State and local boards of health by precept, by example, and by a certain amount of pecuniary aid?

If the answer to this be in the affirmative then the present organization of a board is much to be preferred to having a single minister or director-general of health.

If greater executive powers are to be given to the Board, they should be conferred on an officer selected by the Board.

With regard to the constitution of the Board, and especially as to the number of persons to compose it, it should be remembered on the one hand that the larger the Board the more expensive it is, but, on the other hand, that it is also desirable that each State should be represented in it.

To the members of the medical profession of the United States the question as to whether the present National Public Health Organization of the country shall be preserved and improved, or be abandoned and broken up by Congress, is not one of mere theoretic interest in which they need take little concern.

It is their duty to make themselves, at all events, sufficiently familiar with the subject to be able to give an intelligent opinion to their representatives in Congress as to what legislation is really desirable upon this subject at the present time, and to estimate at their true value the efforts which have been and will be made to induce Congress to abolish the National Board of Health on the plea of economy, and to transfer its duties to some department or person who will undertake to perform them more cheaply.

There will not be the slightest difficulty in finding the person or department willing to undertake this, or, for that matter, any other branch of Government work, even that of Congress itself, at much less than the present cost, but will the work be as well done?

J. S. B.

ART. XV.—*Lessons in Gynecology*. By WILLIAM GOODELL, A.M., M.D., Physician-in-Charge of the Preston Retreat, Professor of Clinical Gynecology in the University of Pennsylvania, etc. 8vo. pp. 380. Philadelphia: D. G. Brinton, 1879.

DR. GOODELL dedicates this neatly bound volume of nearly 400 pages to Dr. S. Weir Mitchell, "as a token of friendship and esteem." A parent may give his child such name as he pleases, even though that name should be Beelzebub or Maud! We cannot, therefore, quarrel with Dr. Goodell for naming this promising child of his brain *Lessons*, though really most of these lessons would, in our opinion, be more appropriately called *Clinical Lectures*. We do not believe *Lessons* was selected from any affectation, but from sincere modesty as well as from a desire to indicate the elementary character of much of the instruction given.

The volume contains twenty-nine lessons, but before considering any of these in detail, we wait for a moment to refer to the author's style. It is a real pleasure to read whatever Dr. Goodell writes. In the preface to this volume the author states he has "a slow pen." And yet he has attained such perfection of art in composition that this slowness of pen is not manifest by any artificial construction of sentences, by any stiff and constrained utterances, but his words seem to flow easily, gracefully, clearly, like waters from a pure, exhaustless fountain. There is nothing superfluous in a sentence, no pleonasm; and yet, on the other hand, the thought is never clouded by the concise expression of it; the author's meaning is as clear as crystal. He is at home in other than professional fields of literature, and occasionally brings thence some valuable ornament or striking illustration. Possibly we would not be far wrong in partly attributing the excellent style he has made for himself, to reading and study of the Bible. We remember seeing it stated by at least one writer upon rhetoric that the three volumes first in importance for the student who would acquire a good style are the Bible, Shakespeare, and *Paradise Lost*. But, from whatever sources derived, with what long and weary effort attained, Dr. Goodell's style is a never-failing excellence, and gives a charm to whatever he writes.

The first of the lessons is upon Gynecological Instruments. It occupies eight pages and illustrations are given of the author's speculum and his examining table. The second lesson is upon Caruncle and other Affections of the Female Urethra. An illustration and description of Paquelin's thermo-cautery are given. The illustration is similar to that given by LeBlond,<sup>1</sup> but we miss several of the cauteries represented by the French author.

The third lesson concerns Vesical Disorders of Women. These by their frequency and some by their obstinacy, vex the physician, sometimes almost as much as the patients, and any light shed upon their nature and treatment is eagerly accepted by him. Dr. Goodell's lesson contains much valuable knowledge, many useful instructions. In referring to a certain variety of frequent and painful micturition, the author remarks—and we give the passage as an illustration of his power to say much in little, and to say it clearly:—

<sup>1</sup> *Traité Élémentaire de Chirurgie Gynécologique*, Paris, 1878.

"The bladder is hysterical, if you choose so to label it, and the motto of an hysterical bladder, as regards local treatment, should read, *noli me tangere*."

In considering the treatment of vesical calculus, he remarks:—

"The operation of vaginal lithotomy in the female is, however, so easy and so safe a one that it would, in the vast majority of cases, be far better to extract the stone by incision than by crushing."

We cannot accept this statement. On the contrary, we believe that it should run thus, in the vast majority of cases it would be far better to extract the stone by crushing and dilatation than by incision. In the first place, these calculi usually consist of phosphate of lime or phosphate of magnesia and ammonia, are quite soft and are very easily crushed. Then take, for example, eleven cases of lithotritry in the practice of Civiale and nine in the hands of other surgeons, every one recovering, and contrast the result with eleven cases, as given by Hybord,<sup>1</sup> of extraction of the stone through the vesico-vaginal wall, nine recovering and two dying,<sup>2</sup> and surely we cannot give such unqualified indorsement of lithotomy as Dr. Goodell. We believe, as stated by Hybord, it ought to be reserved for cases where the stone is both large and hard, or is encysted, or is associated with calcareous concretions upon the vesical wall.

The fourth lesson is upon *Fistulæ of the Female Genital Organs*. On p. 44 of this lesson there is an excellent illustration, modified from Beigel, of these different fistulæ, and on p. 46, with other instruments, some five different knives are represented, but not one pair of scissors, though these are probably better and more generally used in operating than any or all scalpels.

The fifth lesson, *Closure of the Vulva for Incurable Vesico-vaginal Fistula; Tumours of the Vulva*, contains under each topic a most interesting case. The first of the cases is one where closure of the vulva with opening of the recto-vaginal wall, so that the urine could pass into this new reservoir, was successfully done by Dr. Goodell. He states, "I was emboldened to recommend this step because a very analogous operation had succeeded in the hands of my friend Dr. W. W. Keen." This operation, however, was really proposed by Da Costa Duarte in 1865, and the most essential point as to its feasibility had been demonstrated by Baker Brown in 1860. But in this matter we must go further back than either Da Costa Duarte or Baker Brown. In 1836,<sup>3</sup> Jobert proposed an operation the same as that suggested by Duarte. In 1845, Berard, in response to members of the Academy who suggested that the presence of urine in the vagina would prevent cicatrization after the operation for closure of the vulva, said: "Admitting that the urine by its presence tends to open up the passage we wish to close, would it not be proper to form a new temporary route for it by puncturing through the rectum?" In 1851-52, Maisonneuve made a recto-vaginal fistula, and closed the vulva. Subsequently, he made a perineal fistula for the evacuation of the urine, but the patient had mortal phlebitis.

<sup>1</sup> *Des Calculs de la Vessie chez la Femme et les Petites Filles*. By Paul Hybord, Paris, 1872.

<sup>2</sup> In one of these fatal cases the vesico-vaginal opening was spontaneous, and the death was from pneumonia: this case, therefore, should be excluded, and the mortality would be one in ten. The cases of urethral lithotomy given by Hybord present a frightful mortality—twenty cases and eight deaths—one of these deaths, however, was from pulmonary consumption, and three months after, and excluding this, we have nineteen operations and seven deaths.

<sup>3</sup> For these references I am indebted to a monograph, *Du Klesis Génital*. By Anatole Le Double, Paris, 1876.



The second case referred to in this lesson is one of enormous fatty tumour of the left labium—an illustration of it is given on p. 64—successfully removed by Dr. Goodell.

The sixth and seventh lessons, upon Prevention and Cure of Laceration of the Perineum, present no occasion for special remark. They are both excellent.

Local and Constitutional Treatment for Chronic Metritis and Endometritis is considered in the eighth lesson. In referring to intra-uterine applications, the author makes the following remarkable statement:—

“I have come to the conclusion that he is the most successful gynecologist who is the most plucky, and that, no matter how severe or how mild the treatment of uterine disorders, the percentage of accidents will be about the same.”

At least the judiciousness of this statement might be questioned by some. We should like it to be understood that the pluck spoken of must be intelligent, and is utterly different from recklessness.

In the course of the lesson, Dr. Goodell thus tersely expresses his creed of uterine pathology and therapeutics:—

“Since congestion is the essential basis, the *punctum saliens* of uterine disorders, it stands to reason that local blood-letting should be the remedy.”

Excellent directions follow as to when and how to use local depletion. There is one injunction, however, which seems to us useless, and that is the stereotyped one as to plugging with cotton the os uteri in the application of leeches to the cervix, for in the majority of cases requiring such application there is an abundant secretion from the cervical glands, if not from the uterine cavity, which renders applying the cotton plug no easy matter, and at any rate is almost sure to wash it away in a few minutes. For some years we have not made this generally futile effort, and though using leeches frequently, have never had a case where the leech entered the uterine cavity or even attached itself to the cervical canal.

Under the head of Constitutional Treatment some ten formulæ are given, which will, doubtless by the time these lines are in print, have been many times faithfully copied, and might be found on the files of numerous drug-stores.

Five lessons, commencing with the ninth, are chiefly occupied with uterine displacements and their treatment.

Prolapse of the Womb, whether real or hypertrophic, and its treatment occupies the next two lessons. It is quite evident that Dr. Goodell does not indorse the following declaration of Dr. Emmet:<sup>1</sup> “In fact, I am satisfied from experience that removal of the cervix is never called for except in some forms of malignant disease.” He, *i. e.*, Dr. Goodell, refers to cases of “hypertrophic elongation of the infra-vaginal portion of the cervix,”<sup>2</sup> in which he has performed amputation, and he also presents some excellent illustrations from Hegar of the method of operating.

The sixteenth lesson, Laceration of the Cervix Uteri, is one of the most valuable in the book. No writer has more graphically depicted this lesion, its consequences and diagnosis, or more clearly explained the method of operating.

<sup>1</sup> Principles and Practice of Gynecology, p. 481. By the way does it not seem remarkable that New York and Philadelphia cannot agree in orthography. The one gives a work on Gynecology, the other on Gynecology.

<sup>2</sup> Intra-vaginal seems to the reviewer a better term. And why not omit “portion of the”?

Cancer of the Womb is the subject of the seventeenth lesson. Dr. Goodell in referring to the greater frequency of cancer of the neck than of the body of the womb remarks: "The part first attacked is that which bears the brunt of the 'insults' of coition and of parturition." Insults is excellent! It recalls Molière's words in *Les Precieuses Ridicules*, . . . "a sedan chair is a wonderful protection against the insults of mud and bad weather." But no sedan chair can protect the uterus from the insults of coition and parturition! On p. 188, the author makes the following just remarks:—

"While unprepared to range myself under the banner of the 'localists,' I am yet sure that uterine cancer very commonly attacks women of fine physique and blooming health, and that, as pointed out by Cruveilhier, a cancer of this organ is, of all cancers, the least prone to affect the system. The victims die, not so much from specific systemic poisoning and from transference to distant organs, as from septicæmia, from embolism, and from the exhaustion induced by pain, by sleeplessness, and by the bloody or the serous fluxes. I am also further satisfied that the patient of the 'localist' will live longer, suffer less, and stand a better chance of a cure than the woman who is treated with palliative measures only."

Dr. Goodell gives some very interesting cases where operations greatly retarded the progress of the disease, and others where these were followed by complete recovery. Similar experiences are recorded by Dr. Sims in a valuable paper<sup>1</sup> recently published.

Probably what is now most needed in the clinical study of uterine cancer is a recognition of the malady, if possible, in its earlier if not in its earliest stages. The vast majority of cases of this terrible disease usually come under the observation of the physician when it has so far advanced that an operation, if performed at all, is done with the mere prospect of palliation, not with the hope of cure. Pain which in many minor ailments makes outcry enough, in this generally fails to warn the patient of any danger at a time when operative interference would be most likely to be followed by success. The menorrhagia or metrorrhagia which usually first attracts the patient's attention, and by its persistence or profuseness compels her to consult her medical adviser, is a late rather than an early symptom of the disease. But may there not be found by a closer, more scrutinizing study of cases, some earlier indication of uterine disorder that will point to the necessity of uterine examination, and the disease then be detected before pains and hemorrhage have given their alarm?

Vegetations of the Endometrium is the subject of the eighteenth lesson. It is one of the most valuable of the lessons, containing as it does very instructive cases and excellent rules of practice. In the treatment of that variety of these vegetations known as *endometritis hyperplastica*, the curette is all important. Dr. G. recommends the dull wire curette of Thomas, or that failing, the sharp curette of Sims. We have generally found the curette forceps of Emmet the only instrument necessary; and, if a curette proper is required, we prefer that of Recamiér.

The nineteenth lesson is devoted to Polypus of the Womb. In considering the etiology of the disease, Dr. Goodell states: "Sterility and single life are pre-eminent factors in the production of these tumours," p. 219. We are not sure that this statement is correct. Dr. Lever's<sup>2</sup> assertion

<sup>1</sup> The Treatment of Epithelioma of the Cervix Uteri. American Journal of Obstetrics, July, 1879.

<sup>2</sup> Lee on Uterine Tumours, p. 34.

was "that the disease was more frequent in the unmarried than in the married, in the proportion of seven to three." But have his statistics been verified by others? Waller's<sup>1</sup> words are that polypus sometimes occurs "in unmarried females." Churchill<sup>2</sup> states that it is as frequent in virgins as in the married. Wieland and Dubrisay,<sup>3</sup> who consider mucous polypi under the head of acute and chronic metritis, remark that unsatisfied venereal desire, celibacy, suppression of perspiration, or of a hemorrhage, profound emotion, etc., have been regarded as causes of internal metritis, adding that "these causes which are constantly invoked, not only for metritis but for many other maladies, appear to have but a trifling influence." So far as sterility is concerned, is that not a consequence of the polypus rather than its cause? Dr. Barnes<sup>4</sup> remarks, "Generally, however, polypi prevent pregnancy." Schroeder<sup>5</sup> says: "Sterility, due partly to catarrh of the uterine mucous membrane, partly to the mechanical obstruction, is the usual, if not the uniform result of polypus."

Dr. Goodell, in sustaining the assertion quoted, further remarks:—

"My experience is that you will find them to be more frequently the cause than any other factor; but why should they produce them? you will ask. Because the irritation of menstruation continues without any breach. Nature never intends that the monthly congestion should go on indefinitely, but she expects such interruptions as gestation and lactation usually bring. Another cause, closely relating to the preceding, is perverted sexual relations, which excite and irritate without satisfying. In short, uterine polypi and uterine vegetation start pretty much from the same causes."

Admitting the fact, the explanation seems quite rational; but it should be remembered that children sometimes have these growths, one having been observed in a child only two years old; what has celibacy or sterility to do with such cases?

In referring to the diagnosis between polypus and inversion of the uterus, the author remarks:—

"Again, to make sure of no error in this matter, withhold all anæsthetics, and tighten the loop of the écraseur very slowly. If now the woman complains of great pain, some portion of the womb has been noosed." But given a large fibroid polypus with a short, thick pedicle, the tightening of the noose around such a pedicle is surely followed by severe pain. It is reasonable that it should be so, and we know that it is, from observation of such a case.

The twentieth and twenty-first lessons are occupied with Uterine Fibroids and their Treatment.

Dr. Goodell states that from his own observations, those of Dr. For-dyce Barker, and the statistics of Mr. Pollock, he is "inclined to think that single and multiple tumours are about equally divided." On the other hand, Gallard<sup>6</sup> has stated that it is extremely rare to find but one tumour.

We pass on to the twenty-second lesson entitled, "Spaying for Fibroid Tumour of the Womb, and for other Disorders of Menstrual Life." As to the term used, Dr. Goodell remarks, after alluding to the just criticism of the words *normal ovariectomy*, "Now, since it is important to distinguish

<sup>1</sup> Lectures on the Functions and Diseases of the Womb.

<sup>2</sup> Diseases of Women.

<sup>3</sup> French Translation of Dr. Churchill's Diseases of Women.

<sup>4</sup> Clinical History of the Medical and Surgical Diseases of Women.

<sup>5</sup> Diseases of the Female Sexual Organs.

<sup>6</sup> Leçons Cliniques sur les Maladies des Femmes, Paris, 1873.

this operation from that of ovariectomy proper, and since it is not easy to define, except by circumlocution, I shall call it *spaying*—a term which as technically defines the character of the operation as castration defines the analogous operation in the male.”

The criticism generally made upon this selection is that the word is in common use for an operation upon certain inferior animals, and carries with it repulsive associations. The “Conjurer” in *Hudibras*,

“—— With the moon was more familiar  
Than e’er was almanack well-willer.”

And, from this familiarity, knew, among other things,

“When sows and bitches may be spay’d,  
And in what sign best cider’s made.”

Heifers, too, are nowadays frequently the subjects of the spayer’s art. Ought we not to have some better word, or even prefer a circumlocution, for the operation upon women? Spaying smells of the cow-stable, of the kennel, and the pig-pen. Furthermore, the purpose of spaying inferior animals (we refer now only to sows and heifers) is to make them fatten more readily and thus fit them for market: the term is, therefore, suggestive of the slaughter-house and of the shambles.

Finally, spay is not such a legitimate possessor of its present domain that it is entitled to any addition of territory; indeed, it has no hereditary right to that which it now holds. It has come to us from the Latin *spado*, which means<sup>1</sup> “a gelding, whether horse or man.” Upon referring to Tacitus and Juvenal, it will be found that each of these authors makes it the equivalent of eunuch. In the first of Juvenal’s satires these words occur:—

Cum tener uxorem ducat spado.<sup>2</sup>

*Tener spado* can mean nothing else but soft eunuch.

But, going a little further in this philological excursion, *spado* came from the Greek *σπᾶδων*, plural, *σπᾶδοντες*, which is defined<sup>3</sup> as “an eunuch.” Nevertheless, Aristotle draws a distinction between the eunuch and the *spado*. The following<sup>4</sup> is a Latin translation of his reference to the subject—a Latin translation because easier to write and easier to read than the Greek. “Qua re differt spado ab eunucho? Quod eunuchum quidem adolescentuli ætate testibus privarunt, spadonem vero provecta jam ætate.” So then, the *spado* and the eunuch only differed in the time at which they were deprived of their testicles. A reference will be found in the *Scholia Græca in Aristophanem* to *σπᾶδων* in which this distinction is not recognized. We might prolong this excursion, but enough has been adduced to show that to apply the term spaying to removal of the ovaries of any animal is purely arbitrary, and is an utter perversion of the word so far as its etymological history and early application are concerned.

We hope Dr. Goodell will abandon the use of the word in future editions, else spay and antispay may become the strophe and antistrophe of book and of criticism.

The distinguished gentleman who originated the operation, Dr. Robert

<sup>1</sup> Ainsworth’s Dictionary.

<sup>2</sup> The reason for this *unique* selection is given in the sixth Satire: Some women ever take delight in unmanly eunuchs, and soft kisses, and the loss of all hope of beards that precludes the necessity of abortives. Yet the summit of their pleasure is when this operation has been performed in the heat and prime of manhood, and the only loss sustained is that the surgeon, Heliodorus, cheats the barber of his fees.

<sup>3</sup> Liddell and Scott.

<sup>4</sup> *Problematum Ineditorum*, Section xi.

Batthey, in terming it normal ovariectomy, selected a name which satisfied neither himself nor the profession. If this be normal ovariectomy what is abnormal ovariectomy? If the word normal be, by a somewhat arbitrary extension of the term, and by use made synonymous with healthy or sound, and describe the condition of the ovaries, it states what was proved untrue in many of the cases in which the operation has been performed. And then can there be *normal* surgical operations, when such operations are a confession of the impotence of medical therapeutics? Better than spaying or normal ovariectomy a circumlocution; or else as the condition induced by the operation is *agenesia*,<sup>1</sup> we may call the operation *agenesic ovariectomy*. If objection be made to *agenesia* as not being the primary condition sought and induced by the operation, certainly *amenia* is, and the operation might be called *amenic ovariectomy*. Professor Simpson, in his successful case reported in the *British Medical Journal*, May, 1879, describes it under the title of *double oöphorectomy*.

But turning from nominal discussion let us come to the reality.

Dr. Goodell refers to the causes for which Dr. Batthey's operation has generally been performed, and its uncertainty in some cases as a therapeutic measure, adding:—

“But about fibroid tumours of the womb there can be no doubt. The relation here between cause and effect is unmistakable. Their growth and morbid effects are notably increased at each monthly flux, and notably lessened after the climacteric. In but few other pelvic disorders can we so positively single out the ovaries as the hurtful organ.”

This is the foundation upon which he rests the argument for removal of the ovaries in cases of uterine fibroids attended with exhausting hemorrhages, when vaginal enucleation is impossible, contrasting the ovariectomy with hysterotomy or enucleation by gastrotomy. He even goes so far as to say after quoting West's statistics, twenty-eight cases of enucleation with fourteen deaths: “In view of these facts, I am by no means sure that when the question comes to lie between the removal of the ovaries, and the enucleation of a fibroid imprisoned by an undilated os uteri, the former will not be the operation of the future.” The statistics of Pozzi<sup>2</sup> are more recent and present much more favourable results of enucleation, than do those of Dr. West. Pozzi gives but sixteen deaths in sixty-four cases. And it is remarkable that this is just the percentage of mortality in removal of the ovaries for uterine fibroids, twelve cases and three deaths. But, again as illustrating the differences of statistical results, showing how figures, though according to popular judgment they cannot lie, may contradict each other, Dr. Goodell says, “Yet it is a curious fact, established by Englisch,<sup>3</sup> that of the cases in which extirpation of a healthy irreducible ovary was performed for hernia of that organ, one-half died of sub-peritoneal inflammation and its results.”<sup>4</sup> Now on the other hand, Puech's statistics, later and larger, reduce this mortality almost as low as one-third—six deaths in seventeen operations.

However, Dr. Goodell presents a strong argument in favour of what we venture to call *agenesic ovariectomy* in certain cases of uterine fibroids. He gives a table showing all the cases of removal of the ovaries, not merely

<sup>1</sup> Thomas's Pronouncing Dictionary, has *an* in the word: there is no good reason for the second *n*. The New Sydenham Society's Lexicon gives the word as above.

<sup>2</sup> De la Valeur de l'Hystérotomie dans le Traitement des Tumeurs Fibreuses de l'Uterus, Paris, 1875.

<sup>3</sup> Sydenham Year Book, 1871-2.

<sup>4</sup> Annales de Gynécologie, June, 1879. Recherches sur les Hernies de l'Ovaire.

for fibroids, the method of operating, whether abdominal or vaginal, and the results. These statistics show the vaginal operation to be the safer one, thus contradicting the statement of Koeberlé,<sup>1</sup> that preference should by all means be given to the abdominal, and the same view as that of Koeberlé is also taken by Professor Simpson in the paper referred to a moment since.

Ovariectomy, abdominal and vaginal, is considered in the twenty-fourth and in the twenty-fifth lessons. The lessons are excellent, but we have no time for special remarks upon the topics presented in them.

The twenty-sixth lesson is entitled, Nerve-Tire and Womb-Ills, or the Relation of Neurasthenia to Diseases of the Womb. This long title suggests to the reviewer Pascal's thought in regard to Cleopatra's nose.<sup>2</sup> Now if the title had been shorter, the lesson would be quite changed. Nerve Tire and Womb-Ills has just the least flavour of sensationalism, though of course Dr. Goodell had no such thought. He has done wisely in omitting these objectionable words in the third volume of the Transactions of the American Gynecological Society where this lesson appears as the Presidential Address delivered by him before the Society. The profession are already quite familiar through medical journals and through the Transactions with this excellent paper.

The twenty-seventh lesson gives Some Practical Hints for the Prevention of Uterine Disorders. This lesson contains a good many condensed aphorisms which will meet with the general approval of doctors; if they do not so much the worse for the doctors and their patients.

On p. 350 Dr. Goodell remarks:—

"Since labour is in general a strictly physiological process, there can be no sound reason why a woman should not sit up in bed or even slip into a chair whenever she feels so disposed. These are not idle phrases, but the conclusions of a long and well-sifted experience. Such movements excite the womb to contraction, and empty it and the vagina of putrid lochia which may be incarcerated by a clot or by the swollen condition of the soft parts."

This seems almost like an echo of the teaching of Dr. Samuel Bard, the first American author of a work on obstetrics.<sup>3</sup> Seventy years ago this distinguished teacher said: "After one or two days women should rise from their beds and sit up for a longer or shorter time every day, according to their strength and inclination." . . . "The lochia require no other attention than sitting up a short time every day to promote their evacuation."

We do not quite agree with Dr. Goodell in crediting the obstetric binder with being "a factor in the production of female complaints," nor are we content with such doubtful commendation, "the binder may be useful for the first four-and-twenty or forty-eight hours after labour."

How we wish every teacher and every mother would read and ponder the remarks pp. 353-4 *supra*, "too much brain-work, too little house-work!"

"The Relation which faulty Closet Accommodations bear to the Diseases of Women" is considered in the twenty-eighth lesson. The importance of this subject is not exaggerated, and the picture that Dr. Goodell

<sup>1</sup> Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques, vol. xxv.

<sup>2</sup> Si le nez de Cléopâtre eût été plus court, toute la face de la terre aurait changée.

<sup>3</sup> The first edition of Dr. Bard's Compendium of Midwifery was published in 1808, the fourth and last in 1817.

draws of such imperfect accommodations is wonderfully true. We have all seen, and alas too often, just such places as he describes.

The final lesson is upon "The Sexual Relations as Causes of Uterine Disorders." Love, courtship, long engagements, the common social amusements of the youth of each sex, and the honey-moon journey are briefly alluded to, while the most of the lesson is occupied with conjugal onanism.

In reference to two of the topics we make the following extracts:—

"Long engagements, by keeping up a wearing nervous crethism, are not only recognized but even classified by alienists as one of the causes of insanity in women. Much more frequently the nervous exaltation is spent on the reproductive organs, for this follows an awakening of sense, which is not, as in man, appeased by the distraction of business pursuits. Uterine disease from this source any open-eyed physician will over and over again see. . . . If the caresses of lovers are prejudicial to good health, every like relation between the sexes must be exposed to like dangers. In too many rural districts, and in the lower classes of citizens, such license is tolerated in the social intercourse between the youth of each sex as must be destructive to good health and to good morals. . . . Young people are left too much to themselves, and thrown too much together. These social gatherings are too rarely presided over by their mothers or their seniors. As a very natural consequence their games become coarse, their forfeits immodest, and little by little this freedom from restraint is liable finally to degenerate into such gross familiarities as would be improper between even affianced lovers. An unnatural sexual excitement is thus kept up, which must do physical harm."

We do not fully accept these conclusions of our author. For example, the injurious influence of long engagements upon female health is to be explained in the majority of cases, in our opinion, by psychical rather than physical causes. The long engagement exists from the youth of one or the other party, from the opposition of friends, from occasional estrangements, lovers' quarrels, from fickleness, hesitation, from an uncompleted professional education, or from the poverty of the man, etc. The uncertainty, the delay, the anxiety, the hope deferred making the heart sick, the seclusion from general society which occurs on the lady's part in many cases under such circumstances better explain, we fully believe, the ill-health that may result than primary affection of the sexual system, "any nervous exaltation spent upon the reproductive organs." From Tennyson we have learned—

"Woman is the lesser man, and all thy passions, matched with mine,  
Are as moonlight unto sunlight, and as water unto wine."

The stream of her love for man rises higher, flows with a purer current than from any conscious sexual desire. She seeks not, but she is sought, when sexual intercourse occurs it is by submission, not by solicitation on her part; yea when she falls a victim to the betrayer it is because of the mighty passion of love, giving her very self to the one she trusts, and by no insane rapture of animal desire. It is recorded by Moreau<sup>1</sup> that this was the subject of a thesis sustained in the schools of Paris: *Est-ne fœmina viro salacior?* The author of the thesis maintained the affirmative, and a part of his argument is given by Moreau. We have not so learned the womanly nature; we do not thus read woman's character. We firmly believe that one of the most imperious passions in man's breast, has small space in woman's heart, this passion with her in contrast with that of

<sup>1</sup> Histoire Naturelle de la Femme, Paris, 1803.

man is as moonlight unto sunlight, and as water unto wine. Moreover, our faith is that were young men so to regard woman, female virtue would less often be assailed, licentiousness diminished, and they would enter upon married life, mindful in spirit at least, of the injunction of Jeremy Taylor, "Marriage is a provision for supply of the natural necessities of the body, not for the artificial and procured appetites of the mind." These "procured appetites of the mind," how they lord it over feeble conscience and halting will, and make many a sad wife little better than a prostitute save in name! And those who thus sin are often men who have led continent lives. The learned Bayle in referring to Abelard and Heloise remarks, "A man who has lived chastely is more apt to fall into excess with his wife than a debauchee."

To return, Dr. Goodell in referring to the honeymoon, advises against sexual excess. But O, wise teacher, tell your pupils, tell the profession, where lie the boundaries of moderation, where excess begins. While no positive rules may be given, at least they may be approximated, and their inculcation will do a world of good.

In the discussion of "conjugal onanism," the author with a master's hand lays bare one of the deepest, foulest ulcers of the age. He shows how injurious such a course is to the health of women especially. "Should I marry?" said a shallow youth to the great Dr. Johnson. "Marry, sir? No sir! People marry to propagate, and you would propagate ignorance." Alas! people marry who propagate something more than ignorance, propagate foul and fatal diseases. Others marry not to propagate, and if a child comes it is an accident. How shall one or the other sin be corrected? Alas, for our groaning humanity, groaning in such depths of physical and moral evil! Thanks for the brave words Dr. Goodell has spoken so eloquently, words of rebuke, words of instruction and of warning. They will be helpful to the physician and to the philanthropist in hearty endeavours to correct one of the deep-seated evils of the day, a perpetual fountain of other evils.

But we must take leave of this admirable book, thanking its gifted author for what he has done, and expressing an earnest hope that the "Lessons" may soon grow into a complete treatise on diseases of women. T. P.

ART. XVI.—*La Trépanation Guidée par les Localisations Cérébrales.* Par le Dr. JUST LUCAS-CHAMPIONNIÈRE, Chirurgien des Hôpitaux de Paris, Membre de la Société de Chirurgie. 8vo., pp. 150. Paris: Delahaye & Co., 1878.

*Trephining Guided by Cerebral Localization.* By Dr. JUST LUCAS-CHAMPIONNIÈRE.

THE author of this work, M. Lucas-Championnière, is well and favourably known to readers of current French literature. His local rank and authority are indicated by his titles, and he has made himself by his practice and publications a quasi-official exponent of Mr. Lister's antiseptic theory in France. He has shown in many ways that he possesses the thorough professional education which so distinguishes the French, combined in a manner as rare as it is valuable with an ability to think accu-



ately for himself, unhampered by the chains of tradition that have weighed down so many of his colleagues. His report in 1875 of a case of monoplegia following the receipt of a blow upon the head, successfully treated by trephining, together with his hearty acceptance of the new ideas concerning motor centres in the brain, provoked much discussion in the societies and journals, and brought him prominently forward as a defender of the principle of the more frequent use of the trephine generally, and especially under circumstances when the only guide to its point of application is furnished by these physiological data. The theory has met with much opposition, notably in a report made by Prof. Gosselin to the Académie de Médecine, 3d April, 1877, upon two cases of trephining; and the pamphlet now before us is a formal presentation of the arguments in its favour and the answers to objections.

The argument is divided naturally into two parts; the first dealing with the advantages and the risks of the use of the trephine in general, and the second with the question of the sufficiency of limited paralysis as an indication of injury to a definite portion of the cortex of the brain, and of the value of trephining in the treatment of such an injury.

The use of the trephine in modern surgery is, as a rule, rare, and its results have been, apparently, so deplorable that the surgical records of this century and the teachings of modern surgeons are a formidable obstacle to an advocate of the use of this instrument. It is not surprising, then, that M. Lucas-Championnière formally rejects these records almost entirely, charging the fatality not upon the operation, but upon the accidents that necessitated it, and especially upon the delay in performing it, and draws the material for this part of his argument largely from sources that have hitherto been exploited only by the anthropologists. In no other instance, we believe, has the prehistoric man furnished any contribution to surgery, and it was hardly to be expected that his scanty, long-neglected remains would be called upon to show that in his estimate of some things he was more correct than his highly self-respecting, intellectually evolutionized descendant. But such seems, nevertheless, to be the case. The cave dweller of the neolithic age trephined his fellows frequently, and saw them recover. Of his reasons for doing it we are not so certain, for here we have to depend upon that use of the imagination which, although dignified with the epithet *scientific* by the philosopher who practises it, is hotly condemned by him as fanciful and sentimental when employed by his opponent.

The facts are as follows: A number of prehistoric skulls have been found, from which a disk of bone has been removed during the life of the individual by drilling a circle of holes around it with a sharp-pointed stone. In some cases the condition of the sutures and the character of the subsequent development of the skull indicate that the individual underwent the operation in childhood. Other skulls are found showing much larger, regular losses of substance produced after death. Fragments of bone, one side of which evidently formed part of the border of a hole left by trephining, are found suspended upon necklaces or lying within other skulls of which they originally formed no part. The explanation offered by such men as Prof. Broca, Prunières, De Baye, and De Mortillet, and supported by more modern facts to be mentioned in a moment, is that the operation had a religious character, either as a rite of initiation into the priesthood, or by conferring a reputation for sanctity upon the survivor, especially if, as is not unlikely, he was a child afflicted with epilepsy or convulsions.

These are diseases which have always inspired a sentiment of dread, and, as some of their names show—*divinus morbus*, *deifica lues*, *morbis sacer*—have been thought to have a peculiarly divine or sacred origin. Fragments of the skull of such an individual might be worn as amulets after his death or placed within the skulls of the recently dead as a viaticum. The author's speculation that the tonsure of the Roman priesthood is a survival of this practice is ingenious, but foreign to the present purpose.

Corroborative testimony is furnished by various savage tribes now existing in different parts of the world. South Sea Islanders trephine with a piece of glass for the relief of headache, neuralgia, and vertigo. Haytians and Mexicans do the same, and especially for fractures of the skull. Among the fierce Kabyles of Algeria trephining is practised for the slightest injuries, and sometimes even without any apparent reason; the operators are native physicians, invested with a sacred character by reason of their performance of the operation; the instruments even are considered sacred and cannot be bought, they are handed down from generation to generation with the exclusive right to their use. Many of the Kabyles, often the operators themselves, have undergone the operation several times; they consider its danger slight and submit themselves to it coolly and at all ages.

The argument thus begun, that trephining is not in itself a dangerous operation, is carried on by a citation of facts and opinions to show that while trephining was so rarely employed in England, France, and especially in Germany, during the first half of this century that it might be said to have been practically abandoned, yet many of the best surgeons publicly maintained its propriety on theoretical grounds. By its limitation to the most severe cases, and especially by the delay in practising it, its recorded mortality rose above that of non-intervention, and increased, if possible, its disrepute. In the United States it was in more general use, and during our Rebellion it was performed 229 times, with 101 recoveries, 126 deaths, and 2 unknown. A singular exception to this general rejection of the trephine is furnished by the practice among the miners in Cornwall, where fractures of the skull are frequent, and it is the rule to trephine immediately, the operation being always expected and even insisted upon by the patient or his friends. A Dr. Michel reports that during his apprenticeship in this district a week rarely passed without one of these operations, and sometimes as many as three were performed in a single day at the surgeon's office, the patients returning afterwards to their homes. One surgeon had sixty-four disks removed by himself, and another reported that while a student in his father's office he had seen him operate forty or fifty times. Mr. Robert Hudson, who published these facts in the *British Medical Journal*, July, 1877, says the patients as a rule recovered, and he attributes the success to the purity of the air and the early performance of the operation, comparing it in this respect to kelotomy.

The final argument is of course drawn from the success of antiseptic surgery, and it is claimed that the immunity conferred by Mr. Lister's method upon the gravest operations will be extended also to the removal of a portion of the cranium or the simple exposure of the dura mater. A few successful cases are mentioned in support of the claim, among them one in which Mr. Lister opened the longitudinal sinus, and arrested the "terrible bleeding" from it by plugging the opening with a bunch of catgut ligatures.

The second branch of the subject, dealing with the surgical uses to be

made of the theory of motor centres in the brain, possesses a more novel interest. Briefly stated, the theory is that in the cortex of the brain, within a region lying under the anterior half of either parietal bone, are to be found distinct areas from which proceed the impulses that excite movements in different groups of muscles on the opposite side of the body. When any one of these areas is irritated the corresponding muscles are convulsed; when it is crushed or compressed the muscles are paralyzed. The surgical inference is the converse of the last statement; paralysis limited to one or more groups of muscles indicates a lesion of a corresponding limited area of the surface of the brain; and the therapeutical rule sought to be established is that under such circumstances the trephine should be applied over this area for the removal of the cause, whether it be a collection of pus, a clot of blood, or a depressed fragment of bone.

Our knowledge of special centres in the brain is a recent acquisition. The first contribution to the subject was made by Broca about ten years ago in locating the centre for articulate speech at the posterior extremity of the third frontal convolution on the left side. Since then, Ferrier in England, Fritsch and Hitzig in Germany, and Charcot and Pitres in France, by experiments upon animals and observations upon men, have established, with only slight disagreements, centres for the action of all the larger groups of muscle. Some physiologists, prominent among whom is Brown-Séquard, have denied the accuracy of these assertions, and claimed that all movements produced experimentally by electrization of the surface of the brain are due to the action of the currents upon its base. We cannot undertake to examine all the arguments urged in support of, and in opposition to, the theory, but the answer to this objection, which is a serious one because it attacks the accuracy of the experiments upon which the theory is founded, must be stated. It is this: electrization of given points on the surface always excites movements in the same muscles; if this action were due to diffusion of the currents to the base of the brain it would not always be the same, for the very idea of diffusion precludes limitation of the effect, and the electrization which causes movements in the arm to-day would cause movements in the leg or the face to-morrow. The hypothesis of an unknown motor centre at the base is more difficult to accept in explanation of these experiments than that of localized centres on the surface, for which it is offered as a substitute. Moreover, the clinical facts are not affected by this objection.

The centre for articulate speech is situated, as we have said, at the posterior extremity of the third frontal convolution, just above the anterior extremity of the fissure of Sylvius. The motor centres lie on either side of the fissure of Rolando, which runs from the centre of speech backward and upward towards a point on the median line about two inches behind the site of the anterior fontanelle. The centres for sight and hearing lie behind and below the others, about the posterior end of the fissure of Sylvius. The centres are distributed in the following order, beginning at the upper end of the fissure of Rolando: 1st, the centre for the lower limb; 2d, centre for the arm (middle third of the adjoining convolutions); 3d, centre for the face (lower third). The differentiation has been carried much further, and special centres found for smaller groups and even for individual muscles, but the above is all that is required from the surgical standpoint.

The next thing is to establish a rule for tracing upon the scalp a line that will correspond with sufficient accuracy to the fissure of Rolando

about which all these centres lie. It is not necessary that this line, the "Rolandic line" as it is called, should represent the position of the fissure with mathematical exactness, for the diameter of the crown of the trephine is sufficient to correct any inconsiderable departure from the exact point sought. It is much more desirable to have a method that can be used promptly and readily with sufficient accuracy. The relations of the upper end of the fissure to the bregma, or point of intersection of the sagittal and coronal sutures, are very constant. The two points are distant from each other about two inches along the median line. It is, therefore, only necessary to find the bregma and measure  $2\frac{1}{8}$  inches (55 millimetres) backward from it to determine one of the two points between which the line is to be drawn. The bregma is situated at the intersection of the sagittal suture and a vertical plane passing through the external auditory meatus on each side when the head is erect, and may, therefore, be found by drawing a tape line across the crown in this plane from one ear to the other. This method is liable to a slight error, on account of the difficulty of determining the position of the vertical plane, especially when the patient is recumbent, but with care the error is unlikely to amount to more than a quarter of an inch.

When time allows, M. Lucas-Championnière recommends a simple instrument employed by the craniologists to determine the position of the bregma. It consists of two narrow strips of steel united at a right angle. It is asserted that if the point at which the strips are joined is placed at the auditory meatus, the horizontal strip carried across the upper lip close against the nose, and the vertical one bent over the vertex, the latter will lie upon the bregma. In a number of experiments made to determine the accuracy of this method, we have found that while it indicates the position of the bregma correctly in some cases, it more frequently passes in front of it, sometimes even more than an inch. The assumption upon which the method is based, that the auriculo-bregmatic and auriculo-nasal planes are always at right angles to each other, is incorrect. We should, therefore, reject this method and trust to the first, the error of which cannot be great. Moreover, as it is situated at one end of the line it is diminished at all other points by the convergence of the true and false lines in their course downwards and upwards.

The point at which the line ends below and in front is found by taking a point on the posterior edge of the external angular process of the frontal bone, a little below the level of the upper margin of the orbit, and drawing a line directly backwards from it (the head supposed to be erect) for the distance of  $2\frac{1}{8}$  inches (7 centimetres), and then a second line from the posterior end of the first  $1\frac{1}{2}$  inches (3 centimetres) directly upwards. The upper end of the second line marks the point sought.

The motor area is in the form of a parallelogram an inch wide, traversed centrally by the Rolandic line, and stopping half an inch short of the sagittal suture. The centre for articulate speech lies at its lower anterior angle, or a little below and in front of it. Three applications of a trephine of ordinary size within this region will expose it to thorough examination, and it is not probable with a distinct, well limited paralysis, that more than one application would be required to disclose the lesion.

Paralysis of, or convulsions limited to, one lower extremity would require the trephine to be applied at the upper end of the motor region on the opposite side of the head; paralysis of the arm, at the middle third; paralysis of the face, at the lower third or at a point a little in front of it.

In simple aphasia a point should be chosen below and in front of the lower end of the line. In combinations of these paralyse the trephine should of course be placed at points intermediate to the respective centres.

In his collection of clinical facts to support these doctrines M. Lucas-Championnière has limited himself to the presentation of a few typical cases, including his own, and to an examination of 173 cases of paralysis following gunshot wounds of the skull recorded in the *Surgical History of the War of the Rebellion*, in 139 of which the parietal bone was the one involved. A typical case, to be useful for this purpose, must be one in which the traumatism is limited to the cranium and followed immediately by paralysis, and it is desirable also that the paralysis should be a monoplegia, for an extensive lesion, penetrating wound, etc., is less demonstrative. Convulsions, too, being phenomena of irritation, may be due to injury received at a certain distance from the irritated nerve centre; and secondary or tardy paralysis, being the result of later inflammatory processes, is open to the same objection.

It seldom happens in recorded cases that the seat of the lesion is described with sufficient detail to determine the exact position of an individual centre, but they furnish abundant testimony to the existence of a motor area for the opposite side of the body under the anterior half of each parietal bone. The author's own case is so complete an example of the correspondence between a localized injury and a localized group of symptoms, and of the principles of surgical interference guided by the new theory, that a brief account of it will be useful as an illustration.

The patient, a man 26 years old, was found insensible in the street and brought to the hospital on the night of the 15th Nov., 1874. On examination the next morning he was found in a condition of stupor, from which he could be but slightly roused; sensibility was preserved everywhere, but there was partial paralysis of motion in the right arm. The only lesion to be found was a slight superficial cut half an inch long over the left parietal eminence. Respiration slow and regular, pulse "calm." He remained in this condition until the 19th, when he was seen for the first time by M. Lucas-Championnière, who then took charge of the service. He was entirely unable to swallow, and was nourished by enemata. The left side of the head was shaved and another careful examination made. The wound had united and was perfectly dry, with no swelling about it, and apparently no tenderness on pressure. No fracture could be detected. There was ecchymosis in the eyelids and under the ocular conjunctiva; no escape of blood or serum from the ear. On the evening of the 20th the patient made a few convulsive movements, and on the morning of the 21st his stupor had increased, and convulsions occurred frequently with considerable violence, involving all parts of the body except the right forearm and hand. During the following night the convulsions became almost continuous, and the next morning his condition was decidedly worse; pulse 70 to 80 and very small, respiration laboured, temperature  $96\frac{1}{2}^{\circ}$ , head thrown back and agitated from side to side, convulsions very frequent, lips cyanosed and covered with froth.

Suspecting a fracture of the inner table, M. Lucas-Championnière decided to trephine immediately at the seat of the wound. After the bone had been exposed and the periosteum raised a fine fissure was seen at the anterior angle of the incision running forward. The incision was extended a considerable distance in the same direction, and disclosed a fracture situated above and in front of the ear. There was but slight depression,

and the fragments were tightly wedged together. The trephine was applied, and the fragments removed with some difficulty, one splinter extending under the edge of the opening. The dura mater was bruised but not torn, and pulsation could be seen through it. The wound was thoroughly washed with carbolized water, and covered with antiseptic dressings.

Five hours after the operation the patient was still somnolent, but had had no convulsive attacks, and had swallowed some liquids. His temperature had risen to  $97\frac{1}{2}^{\circ}$ . The next day he was less somnolent, opened his eyes when spoken to, and swallowed easily, but had a slight convulsion in the afternoon. On the 25th the stupor had disappeared, and it was found that the patient was unable to speak. On the 26th he recovered the use of his right arm, and on the 27th he sat up in bed. From this time on he improved steadily, but remained unable to speak until the 6th December, when he uttered the words *oui* and *non* distinctly. By the end of the month he was able to help in the wards, to read again, and to write.

Some points of the case require a word of comment. The paralysis was immediate, and the direct consequence of the depression of the bone. The convulsions began on the fifth day, and were due to the spread of an inflammatory process set up by the traumatism. The removal of the fragments arrested this process immediately, but more time was required to restore the integrity of the centres of speech and of the muscles of the right arm which had suffered the consequences not only of the direct injury but also of the local irritation maintained for more than seven days by the presence of the fragments. It seems probable that, if the fragments had been removed immediately after the receipt of the injury, the recovery would have been more rapid.

The fracture, as was proved by many subsequent measurements, was situated at the middle and lower portions of the Rolandic line, at a considerable distance in front of the small scalp wound. The surgeon, not being in possession of the more recently-discovered facts concerning cerebral localization, proceeded to trephine at the seat of the only apparent lesion, and was led to the right spot by the fortunate discovery of a fissure. Had he been aware of a motor centre for the arm (the stupor of the patient prevented recognition of the aphasia) it is possible that a careful examination of the corresponding point on the surface might have enabled him to detect the fracture through the scalp; and even if a surgeon should hesitate to trephine with nothing but a limited paralysis to guide him, he might well feel justified in making an exploratory incision at the indicated point in search of a fissure or other evidence that would be more convincing.

The theory has certainly done something for the art of surgery; it has at least indicated the points at which search must be made for a hidden lesion. Suppose a case somewhat like the above: a man is picked up in the street insensible, with paralysis of one extremity. Instead of having to explore the whole cranium the surgeon directs his attention at once to the anterior half of the parietal bone on the opposite side, and examines it in a manner and with a minuteness he could not well employ if the area to be examined were much larger. Or suppose that in a case of scalp wound with suspected fracture of the inner table, the trephine has been applied at the wound and nothing has been found; the doctrine of motor centres will then indicate the direction in which the opening should be enlarged.

The author has considered it necessary to go beyond the limited ques-

tion of trephining guided by the facts of cerebral localizations, and point out the indications for the use of the trephine under a variety of circumstances, some of which we may briefly mention, premising that his arguments are based upon the supposition that the antiseptic method will always be employed.

In a case of depressed fracture with absence of cerebral symptoms he would trephine immediately, or at the appearance of the first symptom; he certainly would not wait until the symptoms became serious.

In compound fracture without depression he would not interfere unless, or until, there should be coma, paralysis, convulsions, or fever with or without delirium.

Coma is not in itself an indication, for it may be merely a symptom of concussion; but it is an indication when associated with other symptoms, and especially with depression. It certainly is not a contraindication.

Paralysis is the best indication. It may be immediate or secondary, and its value is greater in the former than in the latter case, for primary, immediate paralysis indicates an existing permanent lesion of the brain, while secondary paralysis may be due to an inflammatory condition of the meninges or brain, possibly capable of spontaneous recovery. Moreover, it indicates the seat of the lesion less precisely, for a larger area is always involved. In primary paralysis the lesion of the brain is situated at the fracture; in secondary paralysis it may be at some distance from it. The rule, therefore, would be in a case of primary paralysis to trephine immediately at the seat of the fracture with the object of removing depressed bone or a blood-clot; and in secondary paralysis to trephine after the paralysis has lasted a day or two, or immediately if it is associated with general or partial convulsions, with the view of evacuating a collection of pus. If the application at the seat of the fracture does not yield the expected results, trephine a second time over the motor centre corresponding to the paralyzed muscles.

Convulsions, in themselves, are an indication only when they are localized and persistent, and especially if they alternate with paralysis of the same muscles.

In a case of suspected fracture of the inner table he considers the trephine rigorously indicated on the occurrence of the first serious symptom, especially a paralysis; and its point of application should be selected according to the theory of motor centres. The indication is the same whether the symptoms are primary or secondary, but in the latter case the operator should be prepared to make a larger opening and to incise the dura mater.

L. A. S.

## ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XVII.—*Guy's Hospital Reports*. Edited by H. G. HOWSE, M.S., and FREDERICK TAYLOR, M.D. Third Series. Vol. XXIV. 8vo. pp. xx., 498. London: J. & A. Churchill, 1879.

ALWAYS a welcome visitor, the Report of Guy's Hospital for 1879 is not unworthy of its predecessors. It contains twenty papers, of which we will first notice those of surgical interest.

MR. THOMAS BRYANT opens the volume with a paper of no little importance, *On the Value of Operative Interference in the Treatment of Inflammation of Bone*, being Part IV. of his *Reports on Operative Surgery* in former volumes. He gives twelve cases pertaining strictly to the subject, and illustrating the value of free and early incisions in periostitis and endostitis, resulting generally in speedy relief without necrosis; and also the value of drilling and trephining bone, the subject of chronic inflammation or of suppuration. That we often forget the analogy between the hard and the soft tissues in the various inflammatory processes is only too true, and he who would make an early incision in the soft parts, often waits in similar conditions in the hard, until the bone is hopelessly necrosed or the neighbouring joint involved. Drilling the bone is so easy and simple an operation, that we trust Mr. Bryant's name may tend to popularize it. Should it not relieve, the somewhat more serious operation of trephining may be resorted to.

The third paper also deals with bone, being *Three Cases of Injuries to the Elbow*, by Mr. S. A. WRIGHT. The second case would furnish another argument to Dr. Allis in his war on the time-honoured anterior angular splint, for its application in an epiphysial fracture produced occlusion of the arteries of the forearm for twenty-two days. The boy, we are told, "fell from some banisters." We presume Mr. Wright means fell from a "balustrade."

In narrating the third case (an unusual one of fracture of the head of the radius), the writer proposes two lines for guidance in diagnosing injuries at the elbow, and, although they are not entirely satisfactory, yet in the obscurity which so often surrounds joint injuries, especially in the elbow, we welcome every additional means of diagnosis as of some value. One of these is the old line between the condyles, best taken with the arm in horizontal extension, when the line will be vertical. The other extends from the internal condyle to the head of the radius. This will pass through the upper border of the olecranon and be bisected by its superior and external angle. It is of equal value in all positions of the joint. If the relation of any one of these points to the line is abnormal, displacement is shown, and its cause is to be sought in dislocation or fracture.

The second paper is by Mr. CHARLES HIGGINS, on *Glaucoma*. There is little, if anything, new in the article, not even in his confession of ignorance as to the cause of the increased tension, or the reason of its relief by iridectomy. Brilliant empiricism has outstripped philosophic speculation and physiological experiment, as is not seldom the case in the healing art. Twenty-two cases are reported.

Dr. W. A. BRAILEY contributes also an ophthalmological paper *On the Anatomy of the So-called Pars Ciliaris Retinæ and Suspensory Apparatus of the Lens of the Human Eye*. It has a plate containing six figures illustrating histological



details, and we must refer the reader interested in the subject to the original paper.

Article IX. is a *Note on a Case of Tetanus*, by Messrs. CARRINGTON and WRIGHT. In the gray matter of the spinal cord, on the right side, in the cervical enlargement, and in the lumbar enlargement on the left, visible cavities were found, two inches in length and about one-sixteenth inch in diameter, in the cervical region, the other much smaller. They were the results of softening, as shown by their margin of débris, which shaded off through a hyperæmic zone into healthy tissue.

Mr. C. H. GOLDING-BIRD has a paper of thirty pages on *Constructive Inflammation and Ulcers*. He enters very minutely into the structure of embryonic tissue, granulation tissue, and cicatricial tissue, showing their relations to each other as well as the individual characters of each; and then into the process of "epitheliation" or "skinning." Ulcers are defined as "a limited area of granulation tissue upon the surface of the body," and their repair he believes to be not a pathological but a physiological process—the normal growth and epitheliation of granulation tissue wherever found. On this idea he shows what are the various kinds of ulcers. The paper is scarcely suited, either by its character or its length, for a place in a volume of hospital reports.

Two allied papers must next be noticed, one by Mr. W. E. PALEY and Dr. J. F. GOODHART, entitled *A Contribution to the Etiology of Scarlatina in Surgical Cases*, as observed in the Evelina Hospital for Sick Children, and the other by Mr. H. G. HOWSE, on *An Epidemic of Surgical Scarlatina*, in Astley Cooper Ward of Guy's, in 1878. The first paper contains details of twenty-five cases of surgical scarlatina (besides some of measles, etc.), all that occurred from 1869 to 1878, while the second, details four cases occurring within a month, the last three, indeed, within eight days. Both Dr. Goodhart and Mr. Howse were originally of opinion that such a roseoloid rash was not scarlatina, but merely one of the first indications of septicæmia. But after observing the probable infection, the sources of which are often most carefully traced, the symptoms, such as the rash, the fever, the sore throat, the desquamation, and the albuminuria, and the infection of others with distinct non-surgical scarlet fever as a sequel, they have been convinced that it is true scarlatina—a conclusion any fair reader can scarcely controvert, especially if he have seen any cases of it himself. The important conclusion, especially applicable to hospitals for children, is well formulated by Mr. Howse: *That any case which develops a high temperature with roseoloid rash, either within a short period after an operation or during the course of some surgical malady involving suppuration or discharges of any kind, ought to be treated by isolation just as if it was a proved case of scarlatina, and not permitted to return to the ward until the period of desquamation is quite passed.* Such a course at once arrested the epidemic giving title to the paper.

Both of the papers definitely support Paget's previously expressed explanations, that either the condition induced by an operation gives a peculiar liability to the reception of the poison, or else, that having received it already, had the patient not been in ill health, he might have resisted it longer or entirely. But they clearly widen the explanation, and make it apply to any local inflammation, especially if attended with suppuration, for one-third of Dr. Goodhart's cases had had no operation at all. Another important fact is, that of the twenty-nine cases seventeen were dressed antiseptically. Mr. Goodhart draws the conclusion that the contagion obtained its hold on them, not through the wound, but in the ordinary way, for if the antiseptic dressing has banished (as it has) from their wards septicæmia, pyæmia, and erysipelas, the poison of scarlatina would probably also

have been prevented access by the wound. Mr. Howse would add to this that had antiseptics not been used, the high temperature induced by the fever would have favoured decomposition in the wound, and so the whole train of septicæmic symptoms would have followed the rash which is so often its initial step; but that this decomposition was prevented by the antiseptic system. Both of them, we believe, are legitimate conclusions.

The next paper to be noticed is the one by Mr. R. C. LUCAS, entitled *Clinical Surgical Studies*. He narrates two cases, both of interest. The first is a successful amputation of the thigh, which illustrates very well the importance of attention to small details, and the happy results which may follow. The patient, æt. 20, had a large osteoid chondroma of the left femur, the result of a fracture. The well leg was wrapped in cotton and flannel, and the body well blanketed to prevent cold. Esmarch's bandage was applied up to the knee, and Lister's tourniquet then applied to the aorta, although it seems not to have arrested the pulsation. An antero-internal flap was dissected, and the vessels secured by two torsion forceps, divided between them, and each end twisted. Lister's method was used, except the spray. Of its value in preventing danger from erysipelas, he is so fully convinced, that he has "twice amputated the leg in the erysipelas ward, and kept the patients side by side with patients suffering from erysipelas until their complete recovery." His recovery was remarkable. Only on four days did the temperature rise above 100°, the highest being 101.2°. He had almost no suppuration, sat up in three weeks, and left the hospital in six with the stump entirely healed. Six months later he was readmitted for a generalized return of the disease in a sarcomatous form, and died six weeks later.

The second case was that of a femoral hernia in a woman suffering from orthopnoea and general dropsy, the result of cardiac disease. Twice at an interval of ten months the hernia became strangulated and was operated on, ether being used the first time and chloroform the second, in spite of the cardiac disease. She died eleven days after the second operation, when an unsuspected hemorrhage of large amount was found in the iliac fossa probably from a vein which was greatly engorged from the cardiac trouble. The dropsy, the œdema, and the compulsory erect posture were serious mechanical obstacles in the operations.

Mr. N. DAVIES-COLLEY furnishes two papers. The first records a *Case of Removal of the Uterus and Ovaries for a Fibroid Tumour of the Uterus*, weighing 25 pounds. The value of the antiseptic method is again shown in the fact that only once did the temperature rise to 101°, and no symptom of peritonitis followed. The clamp was removed after sixteen days.

The second is on *The Bloodless Removal of Vascular Tumours*, a subject almost as fertile as that now threadbare topic the "treatment of the pedicle." If we may trust the doctrine of evolution we shall however in time arrive at perfection in both. Mr. Colley's method is modified from Teale's, and has merits not to be overlooked. "Two strong needles threaded with wire sutures transfix the base of the tumour, the needles lying parallel to each other and perpendicular to the long axis of the nævus with their points of entrance and exit at least a quarter of an inch from its margin. A hare-lip pin is next introduced in the same way but at right angles to the needles. India-rubber tubing is next wound beneath the exposed extremities of the needles and pin, and the growth dissected out, leaving the skin over it if it seems but little affected." The needles are then drawn through, the wire sutures are twisted, and the pin and the tubing are withdrawn. No bleeding follows.

W. W. K.

Though fewer in number than the papers of purely surgical interest, the medical papers form the bulk of the volume before us and comprise articles by such well-

known writers as Drs. Wilks, Habershon, Goodhart, Savage, Mahomed, Hilton Fagge, and Frederick Taylor.

The first of these is a long historical paper by Dr. SAMUEL WILKS, on the *Physiology of the Nervous System*, with especial reference to the influence exerted by the older phrenological writers on the development of our knowledge of nerve physiology, particularly such subjects as the relation of brain and mind, the use of the double brain, aphasia, the sense of weight and muscular resistance. The paper will be read with great pleasure by all who are interested in such subjects, but is not an article to which we can at all do justice in an abstract.

The next paper is by Dr. S. O. HABERSHON, and is entitled *Clinical Cases of Disease of the Brain*, divided into three headings of Abscess, Embolism, and Tumour. Under the first heading the author gives a tabular statement of 31 cases of abscess in the brain that had occurred in Guy's Hospital since 1857, when Sir William Gull published the previous cases, with a detailed account of five cases occurring under his care, and one of caries of the cervical vertebræ simulating cerebral abscess. These cases are all interesting and thoroughly reported, but add little light to the obscurity surrounding this subject. The first case under the heading of embolism is mainly of interest as illustrating the fact that aneurismal disease of the brain may occur in young subjects, and is not necessarily connected with advanced life and chronic degeneration of the vessels. A young girl, æt. 16, after two attacks of rheumatism in early childhood, had a convulsion five months before admission to the hospital, which left her with left hemiplegia and partial loss of sensation, from which she partially recovered. Soon after admission, the partial paralysis remaining though there was no loss of sensation, she had an attack of pharyngitis which extended downwards, causing thickening and ulceration of the aryæno-epiglottidean folds and necessitating tracheotomy. She died the next day. She had albuminous urine and a systolic cardiac murmur. At the autopsy an aneurism, half an inch by three-quarters, was found about an inch from the origin of the middle cerebral artery. No emboli were found, though the middle cerebral artery leading to the aneurism contained a little unadherent clot. The temporo-sphenoidal lobes, corpus striatum, outer part of lenticular nucleus, claustrum and external capsule were extensively softened. In addition to the disease of the throat and larynx, the lungs were pneumonic, and the heart showed signs of old endo- and pericarditis; the post-mortem also showed that there had been inflammation of the cellular tissue of the mediastinum, and that a small layer of pus surrounded the recurrent laryngeal nerve, which by producing spasm of the vocal cords serves to explain, in the absence of any œdema glottidis, the intense dyspnoea.

Dr. Habershon has also reported, among other cases under the division of tumours, an interesting case of bulbar paralysis, especially affecting the larynx, in which a glioma was found in the pons and medulla oblongata.

Two cases of *Cancer of the Stomach*, in one case implicating the left lobe of the liver, and in the other causing death by perforation of the cœliac axis, supply Dr. HABERSHON with a text on which he has contributed a concise and graphic account of the symptoms and progress of gastric cancer, with a few suggestions as to the treatment he has found most efficacious. One case seems to illustrate the fact that simple ulcer of the stomach may prove the starting-point of malignant disease, in cases where there is such a tendency, in the same way that a blow on the breast may prove the precursor of cancer, not as its cause, but rather the reason for the mischief selecting that particular part.

The next paper is by Dr. JAMES F. GOODHART, and is entitled *Acute Dilatation of the Heart as a Cause of Death in Scarlatinal Dropsy*. In it the author maintains that, in addition to œdema of the lungs, uræmic convulsions, and inflammation of the serous membranes of the thorax, as the causes to which death in scarlatinal

nephritis is usually attributed, acute dilatation of the heart is of frequent occurrence, and will explain many cases of sudden or comparatively sudden death which are not satisfactorily accounted for by the modes of death thought most usual in that disease; and he reports five cases in which death occurred after severe respiratory distress, in four of which post-mortem examination showed extensive dilatation of the left ventricle with thinning of its walls. As regards the causes concerned in the production of this result, he argues that, since there was no valvular disease in any case, the dilatation must have been due to failure of the muscular tissue either in doing its ordinary work or under some special strain, or, as is probably the case, to the existence of both degeneration of tissue, and excessive demand on the cardiac muscle. The latter condition he finds in the increased strain thrown upon the heart by the suddenly augmented arterial tension of acute nephritis, for even in chronic Bright's disease, when the heart has become in some measure accustomed to the strain, and hypertrophy taken place, by which the muscular power has been increased, dilatation will still occur; especially, then, would it be expected that dilatation would occur when the strain comes suddenly on a heart not protected by hypertrophy.

As an instance of the degenerative changes occurring in the cardiac muscle, Dr. Goodhart relates the case of a girl, æt. 13, in which the heart tissue was found in a state of fatty degeneration after scarlatinous nephritis; for this he finds sufficient cause either in the pyrexia, which is known to produce granular degeneration of muscular tissue, or more probably in the anæmia consequent upon the nephritis.

As regards treatment, the indications that the author follows are to endeavour "to counteract or prevent the anæmia which is so constant in renal disease; to prevent, if possible, the arterial tension reaching so high a point as to endanger the functional integrity of the heart; or to relieve the tension if it should occur." For the first he recommends the milder forms of iron, and for both the first and second indications the *timely* administration of the usual eliminants and particularly the hydragogue cathartics. For the third condition he recommends, in addition to the purgatives, the infusion of digitalis.

Dr. FREDERICK TAYLOR has contributed an account of an extremely interesting *Case of Disease of the Brain, with Descending Degeneration of the Spinal Cord*. A boy, æt. 6, after falling on the back of his head gradually lost power over his legs, his gait being unsteady and tottering, frequently seeming to overbalance himself and then quickly save himself from falling with the other leg. There was no absolute paralysis; towards the last three months of his life, eight months after the injury, any voluntary movement of his limbs quickly induced a tonic involuntary spasm. His intelligence was impaired and his eyesight imperfect (central vision only), though the optic disk and fundus were normal; there was no loss of sensation or hearing. On post-mortem examination there were found no evidences of meningitis, though the veins were very full and the cortex very dark; the base appeared normal in all respects. On separating the hemispheres, the posterior half of the corpus callosum was seen to be uniformly dark brown, translucent, and gelatinous. This condition, which the author regards as a form of primary degeneration, extended from the corpus callosum into the white matter of the posterior lobe on each side. Its general distribution may be described as follows: On the left side, besides involving all the white matter of the posterior half of the hemisphere, it ran down in an irregular manner, tongue-like, into the temporo-sphenoidal lobe, destroying only the central portions, and not approaching the gray matter; in the deeper horizontal sections it was seen to involve just the posterior extremity of the lenticular nucleus; the nucleus caudatus was in its greatest extent free. The whole left third frontal convolution was healthy. The

corpora quadrigemina were healthy. On the right side the disease did not advance so far forwards into the hemisphere as on the left side, but no examination was made of the middle or temporo-sphenoidal lobe. The lenticular nucleus was untouched, but the posterior portion of the thalamus (pulvinar) was involved. The hippocampi major and minor were normal on this side. The optic nerves, commissure, and anterior portion of the optic tracts were normal, but posteriorly they led into a mass of gelatinous material which included the corpora geniculata and posterior portions of the optic thalami. Portions of the lower surface of the crura cerebri were dark in colour, though it was not determined whether this was a primary or secondary change; the disease was the same on both sides, most intense on the inner side, and in the form of sharply defined quadrangular patches. The locus niger and substantia ferruginea of the tegmentum were unaffected. In the medulla, pons, and cord the disease occupied the usual seats of secondary degeneration; in the pons, affecting the vertical fibres of the anterior portion, especially those far out, less so those near the raphé. In the medulla, the anterior pyramids were affected, and throughout the spinal cord the posterior portions of the lateral columns adjacent to the posterior cornua were involved. In the cerebellum, the right corpus dentatum was dark and indistinct; on the left it was distinct, but the gray convoluted line excessively dark like the rest of the cerebral gray matter. In the middle peduncle of the cerebellum on the right side, a small dark gray patch was observed, but was not traced out. One of the most remarkable features of the case, however, is the character of the descending degeneration which was found in the spinal cord. It occupied the usual seat of descending degenerations secondary to cerebral hemorrhage or softening, "but it presents the peculiarity of being a double instead of a unilateral lesion. On each side it affects the crus cerebri, the vertical bundles in the anterior half of the pons, and the whole extent of the pyramids of the medulla oblongata. Below this point the diseased parts coalesce, and the lesion becomes single and median in position; it is obvious that we have here the point of decussation affected, and that where in the spinal cord below we find the diseased tracts again separated from one another, corresponding with the posterior part of each lateral column, it is because the two tracts, down which the disease is simultaneously coursing, have met and crossed at the point of decussation of the pyramids in the medulla oblongata." This portion of the contribution is particularly interesting as furnishing pathological confirmation of the observation of Flechsig as to the course of the pyramidal strands.

The next medical article is a long paper by GEORGE H. SAVAGE, M.D., entitled *Some Uncured Cases of Insanity*. He gives the following formidable list of symptoms which have appeared to him specially as of unfavourable omen: "Fatness; voracious and morbid appetite, eating feces; biting and gnawing the nails and fingers; picking of the face; malformations of the head; great sleepiness, and profound sleep that seems unrefreshing; marked changes in the skin, *e. g.*, congestion and thinning; coarse hair; hæmatoma auris, especially if double. Other symptoms are, in some cases, objective enough, but are more related to the subjective mental condition: complete solitariness and self-absorption; complete change in habits and temper; love of gaudy, tasteless dress and decorations; collection of valueless articles and of rubbish; wearing of string and cotton rings on fingers; constant writing of letters, etc.; unreasonable content and discontent. The next list comprises the more common and more obstinate delusions and hallucinations; hypochondriasis; feeling as if not human; feeling criminal, or only fit for prison; hallucinations of hearing—voices, jeers, hootings; hallucinations of sight, smell, and taste; several hallucinations in one patient; 'surrounded by

the invisibles; tempted or influenced; delusions as to influence by surrounding objects; mistakes about sex and persons."

In reference to the force of inheritance in the prognosis, Dr. Savage thinks that although a simple inheritance of insanity or of neuroses has a great influence in producing insanity, and that idiocy or imbecility may arise in consequence, if the person is not attacked before puberty, even though of insane stock, he or she has a better prospect of at least one recovery than a person without such inheritance.

In a very long and able paper on the *Clinical Aspects of Chronic Bright's Disease*, Dr. Mahomed who is best known to us by his studies in sphygmography, contests the ordinary accepted view as to the sequence of events which result in the increased blood-pressure of chronic Bright's disease. Maintaining that instead of this high pressure being produced by the impeded circulation of poisoned blood, and that this poisoned condition of the blood is due to the imperfect elimination of excrementitious material by the kidneys, the condition of affairs should be reversed, and that the poisoned condition of the blood is the starting-point, first for the vascular disturbances, and second for the kidney trouble. The arguments on which he bases this hypothesis are: 1st, that high arterial pressure is found before there is any sign of kidney trouble; 2d, that certain poisons which are known to cause kidney disease, will cause high pressure before there are any signs of kidney failure, and even while they may be unusually active; 3d, that high pressure will often be found in otherwise healthy young persons having a family history of gout or Bright's disease, who will almost inevitably develop the latter; and 4th, that cases of primary kidney trouble, such as surgical or scrofulous kidney, do not have high blood pressure, while cases of acute Bright's disease, "if the poison be acute and temporary," may lose all signs of high arterial pressure during their recovery, even while the kidneys are manifestly crippled. According to this view, then, the high blood pressure and subsequent cardio-vascular changes are the primary and important features of Bright's disease, while the kidney symptoms "are only secondary, and not even essential conditions."

This is an outline of the author's opinion as to the nature of the clinical condition that we recognize as Bright's disease. While we would not be prepared to admit Dr. Mahomed's hypothesis in its entirety, the value of the hope that it extends, that by the early recognition and vigorous treatment of the condition he terms the "pre-albuminuric stage of Bright's disease" the danger may be postponed or perhaps entirely removed, would entitle it to careful study.

R. M. S.

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ART. XVIII.—*Lectures on Syphilis of the Larynx, delivered at the Hospital for Diseases of the Throat and Chest, London.—Lesions of the Secondary and Intermediate Stages.* By W. MAC NEILL WHISTLER, M.D., M.R.C.P., Physician to the Hospital, Honorary Physician to the National Training School for Music, etc. 12mo. pp. 88. London: J. & A. Churchill, 1879.

THESE are two lectures delivered at the Hospital for Diseases of the Throat and Chest, London, originally printed in *The Medical Times and Gazette*, and now published, with some slight additions, in book form. They are chiefly based on the author's clinical service in the hospital during a period of five years, many of the cases having been under observation for prolonged periods of several months, some of them, at intervals, for two years.

Lecture I. treats of the earliest manifestations of syphilis in the larynx. After detailing the character of the observations made by a number of laryngoscopists,

the author groups the lesions observed by himself under the following heads, discussed in detail and illustrated by a few clinical histories:—

1. Catarrhal congestions simulating those arising from ordinary causes;
2. Congestions accompanied by *diffuse redness* and *swelling*;
3. Mucous patches of various types; and
4. More chronic inflammations, occupying, as it were, the period of transition, the signs of which are *diffuse redness*, *thickening*, and *ragged ulceration*, especially of the vocal cords.

The first two divisions may be dismissed as offering no ground for special comment. Not so, however, with regard to the subject of the development of mucous patches in the laryngitis of secondary syphilis. Before the laryngoscope was employed in the examination of the throat, it was generally inferred that most of the superficial lesions of the laryngeal mucous membrane, in secondary syphilis, were due to mucous patches similar to those observed in those portions of the mouth and throat accessible to direct vision. It soon became evident, however, that these lesions are rare in the larynx, so rare, indeed, that many laryngoscopists have never detected them. Others, again, have observed them in varying proportions. Thus, Dr. Morell Mackenzie "found these lesions in two cases only, out of fifty-two patients whom he examined at the Lock Hospital in 1863;" M. Ferras states "that he only saw one out of nearly one hundred cases;" Gerhardt and Roth "found them eight times in fifty-four mixed cases." Dr. Whistler met with them in twenty-four cases out of eighty-eight suffering with secondary syphilis; "but in eighty-two cases with later manifestations he did not meet any." The discrepancy in these records is greater in appearance than the reality may have justified, for some of the authorities cited make no mention of the length of time that they had their cases under observation, "an important consideration," in the author's opinion. He states that these patches "may be present at the first laryngoscopic examination, or you may, on the other hand, carry out these investigations on the same patient for many weeks or months before you see one." As Dr. Whistler had unusual facilities in observing a large number of patients for comparatively prolonged consecutive periods, it becomes easy to comprehend that his figures are more likely, as far as they go, to indicate an approximatively accurate estimate of the frequency of the lesions, than results from the single examination of a number of syphilitic subjects at any one time in a hospital, or the usual estimate from the records of cases examined intermittently even in a large private or clinical practice. It is highly probable therefore, that mucous patches occur in the larynx much more frequently than laryngoscopists generally have been willing to admit. An important point brought out in relief by Dr. Whistler's labors, is the fact that all his cases of mucous patches in the larynx occurred in individuals with mucous patches of the mouth and pharynx, or of the genitalia. As to the frequency of variation in seat, it may be noted that the mucous patches were located on the epiglottis in ten cases, on the vocal cords in ten, on the arytenoids in four, on the inter-arytenoid fold in two, and on the ventricular band in two. In one case the glosso-epiglottic fold was the seat of the lesion. For details as to the appearances of the mucous patch as developed upon the mucous membrane of the different component structures of the larynx, the reader must be referred to the original.

Immediately following this lecture are two tables indicating the time from infection to the appearance of laryngeal symptoms, the seats of the lesions, and the concomitant manifestations in twenty-six instances of diffuse redness, and in twenty-four of mucous patches respectively.

Lecture II. is entitled "Relapsing ulcerative laryngitis of the earlier and intermediate periods," and comprises the author's fourth group of manifestations. It

is noticeable that these manifestations of diffuse redness, thickening, and ragged ulceration of tissue have been observed in immediate sequence to the stage of catarrh and of mucous patches, and as late as several years after the primary sore, "when there may be tubercular eruptions limited to the arms or legs, periosteal inflammations, or scars from ulcerating syphiloids, with ulcers of the fauces and chronic glossitis." By the way, the term "fauces" is so very undeterminate, that it might be advantageously omitted altogether, and be substituted by the name of the special structure sought to be designated. It is evident here, as in many earlier articles on syphilitic laryngitis, that discrimination is not easy between some of the laryngeal manifestations of secondary and of tertiary syphilis, except at limits approaching either extreme. The doubtful period is designated as "*intermediate*" in the volume before us. Lesions making their first appearance several years, "three or four or more," after the primary sore, can hardly be considered otherwise than as belonging to the clinical history of what is understood as tertiary syphilis, while the lesions following closely the period of secondary manifestations are comprised in the latter category, even if delayed a few weeks later than is usual. Secondary manifestations, if neglected or unrecovered from, may merge in time into the tertiary period, with which they then become identified. The first case cited as representative of the intermediate period presented ulcerations and warty excrescences eight months after infection, and directly consecutive to a series of relapses of ulcerations from mucous patches. This case would ordinarily belong to the secondary period. A somewhat similar local result in the second case cited, with a history of sore throat at intervals of about four and eight years from the initial lesion, and first seen with ulcerative laryngitis at a period two years later, or ten years after infection, would ordinarily belong to the tertiary period. It appears to the writer that due allowance is not made for a series of laryngeal manifestations of tertiary syphilis, characterized by extensive ulceration of the soft tissues, and by unhealthy granulations, but unassociated with the perichondritis and chondritis, so frequently developed as late lesions of the disease.

Three reduced drawings of the laryngoscopic image of the intermediate period of syphilitic laryngitis represent very well the thickening of tissue, irregular or notched ulceration of vocal cords and other structures, and the irregular excrescences at the margins of ulcers in the meso-arytenoid fold, as so frequently presented in lesions of syphilitic origin.

The points of similarity and of discrimination between the appearances in syphilis, and the analogous conditions which are associated with phthisis as it involves the larynx, are lucidly alluded to in a few well arranged sentences.

With regard to the special constitutional treatment, small doses of blue mass (one or two grains combined with opium, three times daily) is the mercurial treatment preferred for early catarrhal syphilitic laryngitis; protiodide of mercury is preferred in the more stubborn cases of ulcerated patches with a tendency to thickening; and bichloride of mercury combined with iodide of potassium is indicated as the best remedy for those cases described last. The various methods of administering mercurial remedies are discussed, but do not require comment here.

The topical medications recommended are solutions of chloride of zinc (fifteen or thirty grains to the ounce of water) in superficial congestions, applied every third day in ordinary cases; sulphate of copper (fifteen grains to the ounce of water) in cases of mucous patches; nitrate of silver (one drachm to the ounce) in cases of chronic ulcerations with thickening, carefully applied, not oftener than once a week. Iodoform is recommended as a local application in relapsing ulcerations, either in combination with glycerine or by insufflation. Dr. Whistler appears to expect a good deal from the local use of iodoform, which he is trying



in the form of pastilles and in that of spray. Sprays of chloride of zinc, sulphate of zinc, perchloride of iron (two or three grains of each to the ounce of water), or of alum (five or eight grains to the ounce of water) are recommended for general use once or twice daily. Local applications to the interior of the larynx are rarely necessary, in the writer's estimation, in the forms of syphilitic laryngitis under discussion in Dr. Whistler's volume, the constitutional treatment alone being usually sufficiently effective in controlling the local manifestations. The use of sprays of water impregnated with some agreeable aromatic, as Cologne water and the like, is useful to cleanse the parts and make them feel comfortable, and even pleasantly so, but the advantages from impregnations with active medicinal agents are but exceptionally apparent. When it is evident that constitutional treatment is not followed by amelioration of the condition in the larynx, then topical interference becomes requisite, as it often is when there are large excrescences interfering with respiration, or enormous swelling or œdema producing the same result.

It will be seen that Dr. Whistler has made good use of his material, and that his contribution to the literature of syphilis of the larynx commends itself both to the syphilographer and the laryngoscopist as specialists, while it places the subject correctly before the general practitioner. The language of the volume is good, the cases are well reported, and there is an air of integrity throughout, which leads us to place a high estimate on the conclusions deduced from the personal observations of the author.

J. S. C.

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ART. XIX.—*Porro's Method of Cæsarean Section.*

1. *Della Amputazione Utero-ovarica come Complimento di Taglia Cesareo pel Dottor Edoardo Porro, Professore Ordinario di Ostetricia e Ginecologia nell' Università di Pavia.*

*Utero-ovarian Amputation, as a Mode of Completing the Cæsarean Section.*

By Dr. EDOARDO PORRO, Professor of Obstetrics and Gynæcology in the University of Pavia. 8vo. pp. 83, 1876.

2. *Contribuzione alla Statistica della Ovaro-isterotomia Cesarea-metodo Porro pel Dott. Egidio Welponer, Assistente alla Clinica di Ostetrica e Ginecologia in Vienna, diretta, dal Prof. Carlo Braun-Fernwald.*

*A Contribution to the Statistics of Cæsarean Ovaro-hysterotomy; Porro's method.* By Dr. EGIDIO WELPONER, Assistant to the Obstetrical and Gynæcological Clinic of Vienna, directed by Prof. Carl Braun-Fernwald. (Lo sperimentale, 6th fasciculus, June, 1877, p. 607, pages 20.)

SINCE the appearance of Prof. Porro's pamphlet, describing his operation upon Giulia Cavallieri in May, 1876, there have been, as far as can be ascertained, twenty-nine additional cases reported, all of them on the Continent of Europe. We have not heard of its having been performed in Great Britain, and we are quite sure it has not been in the United States since 1869.

The operation originated, so far as Prof. Porro is concerned, in this way: On April 27, 1876, a dwarf primipara, of 4 feet 9 inches, entered the obstetrical wards of the Hospital of the University of Pavia. She was 25 years of age, and had suffered severely with rickets in childhood, by which her pelvis was much deformed. At the end of three weeks, May 21, she was taken in labour, the waters broke with the first pains, and after these had continued in all for six hours and forty minutes, the Cæsarean operation was performed by the said pro-

fessor, and a living female child removed. The uterus contracted, but not sufficiently to close the sinuses in the incised portion, and much blood was escaping, particularly from one edge of the wound. Without stimulating the organ to contract by the use of the means ordinarily resorted to, or making use of sutures to stop the hemorrhage, the operator at once decided to remove the uterus, which he did with a strong iron-wire and *serre-nœud*, placing the loop around the cervix opposite the inner os, and then tightening it. When all escape of blood ceased, he cut away the uterus by means of curved scissors, passed a long drainage tube through the Douglas cul-de-sac, tying the ends together, brought the cut cervix to the abdominal wound, and finally closed the incision with wire sutures. The woman was taken in labour at 10 A. M. Cæsarean operation begun at 4.49 P. M., and lasted nineteen minutes, sutures seven minutes, and dressing eight minutes; nine minutes were required for full anæsthesia.

In four days the *serre-nœud* was removed, in a week all the sutures, and in forty days the cure was complete. After several months, an examination showed that the pedicle of the cervix was over an inch long, and that the woman could walk, run, and jump, without the production of abdominal pain.

Had the result in this case been as it was after the same operation under Dr. Horatio R. Storer, of Boston, in 1869, who was forced to the procedure in a Cæsarean case by the violence of the hemorrhage, the pregnancy being complicated by the presence of a fibro-cystic tumour, we should probably have heard little more of the new method. But success, after a bold innovation, is everything to its future continuance, and hence the repetitions of the operation, with alternations of success and failure.

If we look back fifty-one years in abdominal surgery, we will find that the celebrated Prof. James Blundell, of London, after instituting a series of experiments upon rabbits, recommended in his lectures at Guy's Hospital the performance of the very operation to which Prof. Porro's name is now attached. As his language is remarkable, and the subject of interest in this connection, we present a few extracts:—

"In speculative moments, I have sometimes felt inclined to persuade myself, that the dangers of the Cæsarean operation might be considerably diminished by the total removal of the uterus. . . . Rabbits are tender animals. . . . If the Cæsarean operation be performed on a rabbit in the ordinary way, it will generally be found (unless I am much mistaken) that the animal perishes in consequence. But in four rabbits, recently delivered, I made an opening above the symphysis pubis, and raising the wombs from the abdomen, I elevated them above the aperture. . . . I took a ligature, with a needle on its centre, . . . and passed it through the vagina." Dividing the ligature, "I tied one half on the right side, and the other on the left, over each Fallopian tube." After which "I completely removed the wombs, cutting, for the purpose, very close upon the ligatures." After closing the abdominal wound by sutures, Dr. Blundell brought the severed portion of the vagina by traction upon the two ligatures, "in contact with the abdominal incision internally." The operation succeeded beyond his hopes. "Of the four rabbits, three recovered; the fourth dying in consequence of the ligatures slipping from their place. . . . In performing the Cæsarean delivery on the human body, perhaps this method of operating may hereafter prove an eminent and valuable improvement. . . . Perhaps you may do something for obstetric surgery here. Let it be remembered, that in securing the vagina and removing the uterus, we are substituting a wound well secured, and of smaller extent, for one that is larger, and not secured by a ligature at all."<sup>1</sup>

Thus it will be seen: 1. That Prof. Blundell first proposed the operation, after a series of experiments, which satisfied him of its probable success (he did not

<sup>1</sup> Lancet, vol. ii. p. 167, London, 1828.

perform it, for want of an opportunity, but he did remove a uterus with success, in a case of cancer); 2. That Dr. Horatio R. Storer<sup>1</sup> did perform it, in order to save, if possible, a woman from bleeding to death; and 3. That Prof. Porro deserves the credit of having first made a successful gastro-hysterectomy in a parturient woman.

The operation of the Pavian gynæcologist was much condemned in medical periodicals, particularly those from abroad, when the case first appeared; and we are not now prepared to recommend it at home as a substitute for the true Cæsearean section. The woman operated upon by him, after a labour of six hours and forty minutes, might have been saved by the old method; as in almost every parallel case in the United States, as early a resort to the knife has resulted favourably; and believing this, we would not favour a substitute which might, unnecessarily, unsex the woman.

To recommend the Porro method, it will require to be shown, that it can save a larger proportion of what experience tells us are usually unfavourable cases, than the old operation. The arrest of hemorrhage is generally quite a simple matter, where the patient has been but a short time in labour. The chief points of value in the operation we believe to be these:—

1. It prevents the possibility of escape of the lochia into the abdominal cavity.
2. It removes all the sinuses through which septic poisoning usually takes place.
3. It prevents all risk of secondary inertia uteri, and hemorrhage.
4. It diminishes the risk of metro-peritonitis.
5. It admits of direct antiseptic treatment.
6. It prevents the possibility of danger from a subsequent parturition.

What it will do in cases of *osteo-malacia*, as a means of arresting the disease, remains to be seen. It has been claimed by Späth, of Vienna, that it exercises a curative effect; but this requires to be proved. If it will do this, and it is not improbable, as it entirely unsexes the subject of it, then this feature alone will make it of much value in parts of Austria, Germany, and Italy, where the malady is unusually prevalent, as there appears to be no other cure in use.

Dr. Welponer furnishes the following list of the operations that have been performed after the Porro method:—

1. 1876. Prof. Porro, Pavia, one case, successful.
- 2, 3. 1876 and 1877. Prof. Späth, Vienna, two cases, one successful.
4. 1877. Prof. Hegar, Fribourg, one case, died.
5. 1877. Prof. Carl Braun, Vienna, one case, died.
6. 1877. Prof. Chiara, Milan, one case, died.
7. 1877. Dr. Previtali, Bergamo, one case, died.
8. 1878. Prof. Müller, Berne, one case, successful.
9. 1878. Prof. Chiara, Milan, one case, died.
10. 1878. Prof. Tibone, Turin, one case, died.
11. 1878. Prof. Carl Braun, Vienna, one case, successful.
- 12, 13. 1878. Prof. Wasseige, Liege, two cases, one successful.
14. 1878. Dr. Reidinger, Brünn, one case, successful.
15. 1878. Prof. Breisky, Prague, one case, successful.
16. 1878. Dr. Peroglio, Brescia, one case, successful.
17. 1878. Prof. Chiara, Milan, one case, successful.
18. 1878. Dr. Fehling, Stuttgart, one case, died.
19. 1878. Prof. Gustav Braun, Vienna, one case, died.
20. 1879. Prof. Litzmann, Kiel, one case, died.
21. 1879. Prof. Carl Braun, Vienna, one case, successful.

<sup>1</sup> Journ. Gynæc. Soc., Boston, Oct. 1869, p. 223. The woman lived sixty-eight hours.

We make the following additions to this list of Welponer's, viz. :—

- 22, 23. Prof. Tibone, Turin, two cases, one successful.
24. Dr. Peyretti, Italy, one case, died.
25. Dr. Franzolini, Italy, one case, died.
26. 1879. Prof. Tarnier, Paris, at Neuilly, one case, died.
27. 1879. Prof. Tarnier, Paris, one case, successful.
28. Dr. Prevost, Moscow, one case, died.
29. Dr. Fochier, Lyons, one case, successful.
30. Dr. Berruti, Italy, one case, successful.

No. 4 was affected with uræmic convulsions; No. 7 was five days in labour; No. 20 was sixty hours; No. 25 was moribund at the time of the operation; and No. 26 was long in labour; her fœtus and placenta putrid and uterus filled with gas; others may have been equally unfitted for enduring the operation.

This shows a saving of 14 women out of 30. We cannot agree with the author, that this is a very wonderful degree of success, when we consider the skill of most of the operators in charge. The record is very defective in some important points, in that it fails to state the causes of dystocia, the number of hours in labour before the operation, the condition of the women at the time of the operation, and the number of children saved.

If, as we presume, from an examination of several of the cases, a large proportion were operations by election, and performed in good season, we cannot see that the success is in any way an advantage over that of the old method, so far as we are concerned. Take the Cæsarean record of our own country with all its cases (111), and many of them wretchedly treated by midwives before the operation, and we show 48 women saved. Compare this with 14 saved out of 30, under the Porro method, and the new would have 46 $\frac{2}{3}$  per cent. saved, against 43 $\frac{2}{7}$  under the old operation. But take from our 111 cases the early elective operations, and we make a showing of success far beyond the 50 per cent. claimed by Dr. Welponer and Prof. Tarnier, viz., 20 women, and 22 children, saved, and delivered alive, respectively, in 27 operations.

Prof. Tarnier, of Paris, in reporting his two operations recently before the Academy of Medicine, stated that he had seen reports of 29 cases with 15 recoveries, and that his were the first Porro operations performed in France. We believe the Professor to be in error in his figures, as we have found 30 cases with a mortality of sixteen; so that he should have more than 29 to make up the additional success.

In considering the value of this operation, we must examine it from a European standpoint, where women with deformed pelves are so frequently delivered in hospitals and so often with fatal results. Up to June 2d, 1876, when Prof. Späth operated upon his first case, every Cæsarean section for a century in the lying-in hospital of Vienna had proved fatal; and up to May 20th last, when Prof. Tarnier did the same at the Maternité of Paris, every Cæsarean case had proved fatal since the year 1787. At the end of fifteen months Prof. Späth stated that his patient had no remaining indications of the existence of malacosteon. Of six operations performed in the Lying-in Hospital of Vienna, three have saved the mothers and five the children.

The progress of this operation among professors and hospital gynæcologists is one of the wonders of modern surgery. In twelve days after Porro operated in Pavia, Späth imitated him in Vienna, and both cases recovered, the children also being saved. The Pavia woman was rachitic, and the Vienna one suffering with malacosteon; in both the labours had progressed but a short time before the operation, hence their success as compared with other late cases on the list, which

have often failed in consequence. From this very encouraging beginning, a little more than three years ago, the news of success has spread until we find 12 operations placed to the credit of Italy, 8 to Austria, 12 to Germany, 2 to Belgium, 3 to France, 1 to Denmark, 1 to Russia, and 1 to Switzerland; the operators being among the leading obstetrical surgeons of these countries, some of them well known throughout the medical world. There has been a great deal written about the operation, certainly more than twenty-five papers and reports of cases. What is still much wanted is a full clinical and historical record of the work already done; distinguishing the hospital from the private cases, the rachitic from the malacosteon, etc., the early from the late, the exhausted from the moderately strong, and the dwarfs from those of average growth.

As far as we are concerned there will seldom be any occasion to perform this unsexing method here. We have no malacosteon to cure by it; have had but four cases out of 111 in hospitals, and seldom have a dangerous hemorrhage or inertia in any early case. If we will persist in the delays of the last ten years it will make but little difference what operation is performed, there must be a frightful mortality, as there has been. To think of 26 deaths in 32 operations is a sad reflection; but the result is not to be wondered at when 24 of the women were not operated upon until it was too late to have any but the faintest hope of success, except in a few instances; their labours lasting from a day to two weeks, and a large number being two, three, and four days under this fruitless and exhausting process. *Eight early cases* tell the story of the last decade's failures in the United States as compared with former periods of the same length. Leave out the entire work of the last decade and we present a record of 53 per cent. of women saved. Our rate of mortality is not an evidence of the real danger of the old operation, it is an exaggeration, begotten of bad obstetrical management on the part of midwives and accoucheurs.

We should do something to remedy this habit of delay, or to render it less fatal in its effects by the use of some new system of delivery, which shall diminish the dangers of the Cæsarean section in cases thus rendered desperate.

R. P. H.

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ART. XX.—*The Brain and its Diseases. Part 1. Syphilis of the Brain and Spinal Cord, showing the part which this agent plays in the production of Paralysis, Epilepsy, Insanity, Headache, Neuralgia, Hysteria, Hypochondriasis, and other Mental and Nervous Derangements.* By THOMAS STRETCH DOWSE, M.D., F.R.C.P.E., Physician to the North London Hospital for Consumption and Diseases of the Chest, etc. etc. 8vo. pp. 142. London: Balliere, Tindall, and Cox, 1879.

THE fact that constitutional syphilis may and often does attack the nervous system, although well known to many of the earlier writers on venereal diseases, appears to have been forgotten until recalled from oblivion by the researches and writings of Hughlings Jackson, Lockhart Clarke, Hutchinson, and Reade of Belfast. Since then the subject has excited more or less attention among intelligent physicians, as shown by the numerous papers which have, from time to time, appeared in the journals. We cannot, therefore, agree with Dr. Dowse that "the subject is of far greater interest than is usually admitted."

According to our author, the nervous system may become the seat of constitutional syphilis, in consequence of either inherited or acquired instability which makes it the weakest part of the individual; and hence the part capable of making

the least resistance. Thus, a blow upon the head has, in some of the cases which have come under his observation, appeared to be the exciting cause of an outbreak of the disease in the brain or its membranes, just as a similar influence will sometimes determine its localization in an external part—a fact which is as true however of some other constitutional diseases as of syphilis. Not infrequently among the educated classes which furnish a large proportion of the cases, over-study or prolonged mental excitement or depression seems to be a predisposing cause of some potency in the production of cerebral syphilis. Other causes are venereal excesses, and the various debilitating diseases.

Among all the symptoms of syphilitic disease of the brain or its membranes, Dr. Dowse regards headache as the most distinctive and characteristic. In no other form of cerebral growth is the pain so severe as that which results from a gummatous tumour of the dura mater. It is not relieved by pressure; on the contrary, this often increases it. It is, moreover, often remittent and accompanied, he says, by localized increase of temperature. We can confirm the author's statements in regard to the intensity of the pain in cerebral syphilis, having had several cases under our care in which great suffering resulted from it. We could have wished, however, that he had given us the characters by which its nature could be recognized more fully and clearly than he has done.

Dr. Dowse teaches, and we think correctly, that a vigorous mercurial treatment of the primary stages of syphilis renders the liability to a subsequent attack of disease of the brain less than if the individual is neglected or treated in an expectant manner only. He holds, however, and here we think the experience of those who have had most opportunity for observing the disease will bear him out, that it is utterly impossible, no matter how perfectly this treatment is carried out, ever to assert with certainty that there will be no such manifestations. In the later stages he gives the iodide of potassium in large doses—occasionally as much as half a drachm three times a day. In cases where the patient is broken down in health, he prefaces the anti-syphilitic treatment by tonics and nutrients. The book is evidently the result of much careful study of the disease, and contains the histories of many interesting and remarkable cases. The author's style is, however, bad; many of the sentences being so clumsily constructed that it is not easy to arrive at his meaning.

J. H. H.

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ART. XXI.—*Colour-Blindness; its Dangers and its Detection.* By B. JOY JEFFRIES, M.D., Ophthalmic Surgeon, Massachusetts Charitable Eye and Ear Infirmary, etc. etc. 12mo. pp. 312. Boston: Houghton, Osgood & Co., 1879.

THREE papers by Dr. Jeffries on colour-blindness were noticed in the numbers of this Journal for Oct. 1878 and Jan. 1879. The author now publishes the results of his investigations in more permanent form, and gives a complete history of the subject with an account of all that has been done and written by others. Prof. Holmgren's directions for the use of his test are quoted in full. Dr. Jeffries has recently notified us that complete sets of worsteds for making this test can be procured of N. D. Whitney & Co., 129 Fremont St., Boston.

Most of the European governments have taken action in the important matter of excluding the colour-blind from positions in the railway or marine service, where their presence involves the greatest risks, and some of the principal corporations in Great Britain have voluntarily adopted more or less stringent means of

protection; but in this country the subject has hitherto been practically ignored. Dr. Jeffries has the merit of being the first in America to urge its importance. The number of his examinations has reached nearly twenty thousand, and the extent of his investigations enables him to speak with authority. He has succeeded in inducing the Legislature of Massachusetts to take an active interest in the subject, and it has instructed the board of railroad commissioners "to consider whether any legislation is expedient or needful with reference to the employment by railroad corporations of persons afflicted with colour-blindness." It is to be hoped that their report may be in accordance with the teachings of experience and common sense, and that the other States will not long remain behind Massachusetts and the rest of the civilized world.

Dr. Jeffries has repeated the experiments of Prof. Delboeuf, whose paper was also noticed in the number of this Journal for Oct. 1878, with entirely negative results. He does not share the professor's hope that congenital colour-blindness can ever be remedied or relieved.

G. C. H.

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ART. XXII.—*Transactions of the American Gynecological Society*, Vol. III. for the year 1878. 8vo. pp. 472. Boston: Houghton, Osgood & Co. 1879.

THE volume appears this year in a new and more attractive form, with the same care in character of paper and press-work, so marked in its predecessors. The size of the work is somewhat smaller, 472 pages, but in character of contents, the reputation of the Society has been well maintained. This, from the rigid exactions in admission to membership, will no doubt continue, as the object of its organization is work, without any regard to numbers. In most scientific lives there are a few workers and many drones; but in this one, there is a strong feeling prevalent against having a preponderance of the latter element. Hence in the year past, there was but one admission; high distinction in the profession, especially as a contributor to its literature, being regarded as essential for fellowship.

The annual meeting having been held in Philadelphia, much that was said has been already laid before our readers in this Journal's supplemental publication, *The Medical News and Library* (see number for October, 1878): we shall therefore make but few special comments.

This Society commenced four years ago, with thirty-nine founders; has increased by the election of nine; and diminished at the same time by the deaths of three of the original fellows; leaving 45. Of these, 30 are, or have been professors in medical schools, and 33 are connected with hospitals. In fact, but three of the forty-five are neither professors nor connected with hospital work at the present time; one being a distinguished ovariologist; another for years a hospital gynecologist; and the third, well known by his learned and abundant work as a contributor to medical science. It is not then to be wondered at, that the three day sessions of this body should attract a crowd of visitors, or their writings and discussions excite an interest in the medical minds of our country.

In the paper by Dr. James P. White, of Buffalo, upon Extra-uterine Pregnancy, he appears to be of the impression, which is by no means an uncommon one, that it is safer to wait for the indications of nature than to open the abdomen and remove the fœtus. It is to be regretted that Dr. T. Gaillard Thomas was not present at the discussion on this subject, as his experience and remarkable successes lead him to hold very opposite views. The fatal results of waiting, in

this city have satisfied a number of our leading gynecologists that it is safer to operate soon after the death of the fœtus than to postpone.<sup>1</sup> Had Dr. Parry lived to the present time, he would have held very different views from those given in his work on extra-uterine pregnancy, which were taken from a more remote experience than we are now learning from.

The discussion of Dr. R. A. F. Penrose's paper on post-partum hemorrhage gives many valuable points in treatment; Dr. Penrose being particularly strenuous for the use of vinegar; but perhaps the best of the modern discoveries, is that of the very decided hæmostatic effect of hot water, which has been well tested under the eye, in arresting the bleeding from the raw inverted flap made in the operation for the cure of exstrophy of the bladder. The temperature used in the latter instance is as hot as the hand can bear; in the uterus, it is claimed that up to 115° Fah. may be injected.

Dr. W. H. Byford, in his paper upon "Dermoid Tumours of the Ovary," makes this remark on page 173: "Some one else has propagated the doctrine of inclusion, or of a *fœtus in fœtu*; believing that somehow one ovum had become engulphed in the organization of the other, and on account of the nature of its nidus could not attain to complete organization or development." In the day when dermoid cysts were believed to be either twin or direct conceptions of a fœtal character, this may have been a misnomer; but how will Prof. Byford account for such a case as that which came under the care of Dr. John L. Atlee, of Lancaster in 1846, in which a true fœtus escaped from the abdomen of a little girl of six, who lived seventeen years afterwards?<sup>2</sup> The term *inclusion* is not confined to the ovary as a nissus, many cases on record being purely abdominal, located near the stomach, and singularly, in most of the recorded examples on the left side, and often in male subjects.

The paper on "Gastro-Elytrotomy," by Dr. Henry J. Garrigues, of Brooklyn, is well worthy of attention, in view of the fact that this operation is under serious consideration here and in Great Britain at the present time. Dr. G. may be styled the historian of this operation, having reproduced from the originals of Joerg, Ritgen, and Baudeloque, the accounts of the early failures in this form of section. Dr. Thomas has now quite a rival in Prof. Porro, of Pavia, whose operation was performed twelve times last year (1878), with seven successes, in Switzerland, Italy, Germany, and Belgium.

Dr. Theophilus Parvin, of Indianapolis, contributes "Three Cases of Rupture of the Uterus." The question of gastrotomy in these cases has been fully discussed by Dr. Trask, of New York, but so long since that it is virtually re-opened. The mortality after turning and delivery is so frightful that it is a question of moment whether the abdomen should not be opened for the delivery of the fœtus in all cases where the uterus has discharged a portion of its contents into the peritoneal cavity, and the condition of the woman is such as to warrant the use of the knife. A search after unpublished cases of this operation has revealed quite a number of failures, and an encouraging list of successes in the United States. Taking Dr. Trask's collection and our own together would much reduce the measure of success claimed by him, as his cases were all published. At one time we were under the impression that about three out of four women had been saved, but more recent disclosures have reduced the percentage. We presume now that the mortality is about the same or perhaps a fraction less than after the Cæsarean section. We believe that case No. 3 was a proper one for the operation, and would probably have recovered, although it is possible she might have done so

<sup>1</sup> See article by the reviewer in this Journal for October, 1878, and by Prof. T. G. Thomas in number for January, 1879.

<sup>2</sup> Trans. Coll. of Physicians of Philadelphia, 1879.



without resort to the knife, under good nursing. Two similar cases in this city recovered after gastrotomy.

Perhaps one of the most learned controversial papers of the volume is that by Dr. Isaac E. Taylor, of New York, which, as its author was not present, was unfortunately not read or discussed. The title conveys but an imperfect idea of the questions involved: it reads, "On the early delivery of the placenta, when prævia, with the relation of a case of spontaneous separation of the placenta without hemorrhages." After a long *résumé* and discussion of the opinions of various observers upon the question of the gradual obliteration of the cervix during gestation, the author advances the confident belief that such opinions were founded in error, and that "it is immaterial to what part of the uterus the ovum is attached, the fundus, the sides, or the tissues around the Fallopian tubes, or the os internum. The internal orifice is as much closed as the orifices of the Fallopian tubes; it grows *pari passu* with the body in that location as in any other." He gives in evidence of the correctness of his views three drawings from anatomical specimens, showing the length of the cervix at eight months in two primiparæ, and nine months in a multipara, with the closed appearance of the *os internum*.

With regard to the appearance of the *spot* on the placenta, in cases where it is prævia and central, Dr. Taylor, who has seen fourteen of this class, believes that there is no special characteristic feature, the superimposed cervical portion varying with the condition of the placenta and strength of its attachments.

Dr. Taylor also discusses the question of the action of the cervix in dilatation, denying that it is due to inherent muscular contraction, and claiming that this portion of the uterus is "only an annex; a passive organ." . . . "It is as much prepared physiologically by its passiveness to dilate as the fundus, physiologically is to contract." He also says, "I have in several instances had the opportunity of observing by ocular demonstration this mechanism or behaviour of the cervix during delivery."

Dr. Taylor claims priority in the discovery of the non-development of the cervix uteri during gestation, dating his observations back to 1851. He advocates premature delivery in cases of hemorrhage from placental presentation, occurring in the latter months of pregnancy, *i. e.* in the sixth, seventh, or eighth month. We notice also that he still advocates the use of the tampon, introducing a long strip of 1½ inch bandage, and packing it against the cervix, a plan much condemned by some of our obstetricians in this city, the hot-water irrigation being considered much safer and more reliable, any fresh access of hemorrhage being readily detected where the vagina is not plugged up; and measures for arrest can at once be made use of.

R. P. H.

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ART. XXIII.—*The Causes and Results of Pulmonary Hemorrhage, with Remarks on Treatment.* By REGINALD E. THOMPSON, M.D., Cantab., Senior Assistant Physician and Pathologist to the Hospital for Consumption and Diseases of the Chest, Brompton. 8vo., pp. 135. London: Smith, Elder & Co., 1879.

"THE outcome of the physical examination of over twenty-two thousand patients during their lifetime, and of the inspection of three hundred cases of diseases of the chest after the death of the patients," certainly merits the careful attention of the professional reader, especially when it is intimated that he "may find something which is not in accordance with the accepted doctrines of the great masters in medicine." The arguments in the text are enforced by brief

records, in outline or condensed detail, of eighty-three cases, with a few tables of statistics, and several illustrations in colour.

Beginning with a retrospective summary of the views of Hippocrates, Richard Morton, Laennec, Louis, Andral, Graves, Niemeyer, Hertz, and Flint, on the relation between blood-spitting and consumption as cause and effect, attention is called to the difficulties in determining this relation from a clinical point of view, and the propriety of interrogating pathology for a solution of the problem.

The doctrines chiefly combated are the practicability of deciding as to the source of a hemorrhage from the colour and appearance of the blood, and the opinion that hæmoptysis, when indicative of pulmonary disease or due to it, is caused by the growth or decay of tubercle. The published views of Dr. Austin Flint, of New York, are frequently cited in corroboration of conclusions drawn from the author's personal observations.

Omitting further allusion to the diverse causes of pulmonary hemorrhage, attention will be confined in this notice to the discussions of its significance as an evidence of phthisis, as the topic of greatest general interest in medical practice.

To appreciate the arguments of the author it is proper to quote the significance ascribed to the terms *phthisis* and *tubercle*.

"Phthisis appears to me to be that form of destructive disease which terminates a variety of pulmonary diseases which have their origin in inflammation and irritation; it is the common result to which these diseases tend to converge, which they may ultimately assume, and in which they lose their initial peculiarities.

"With regard to the use of the word 'tubercle,' it is used here in a limited sense, the nodular form known to Laennec as gray tubercle, which appears to me to be the result of secondary infection, whether it be considered as a general infection of the lungs, as it occurs in acute tuberculosis, or as a more local affection restricted to portions of the lungs. The latter form is that in which it is generally presented to view in the post-mortem examinations of phthisical lungs, and I believe it results in many cases from infection with septic matter, which is derived from a secreting cavity, drawn over the bronchial tubes into the lobules by the force of insufflation, of which force as an agent, in transplanting matter from one place to another in the lungs, some proof will be given in the following pages.

"It will not be supposed that I mean by this to convey the idea that the bronchial tubes are the only carriers of infective matter, but it would seem that their influence has been overlooked."

The difficulties of deciding from the colour of the blood, whether a hemorrhage originates from the bronchial arteries and capillaries or from the pulmonary veins and capillaries, are shown to be very great, from the fact that both series of vessels circulate arterial blood in health, making it impossible in many cases of trivial hemorrhage to decide from which set of vessels the blood has flowed. For this reason, and for others, our author objects to the use of the terms bronchorrhagia and pneumorrhagia.

All the evidence the author has been able to collect "points to the pulmonary vessels as the usual source of hemorrhage, slight and serious, and the only source of profuse hemorrhage, except in cases of aneurism of the aortic circulation, and of a general hemorrhagic diathesis." The most usual cause of fatal bleeding from the lungs was found to be due to the rupture of aneurisms, varying from the size of hemp seeds to that of small oranges, and in no measure related to systemic aneurisms, but dependent upon local conditions.

The arguments adduced, at different portions of the volume, in opposition to the view that tubercle is the cause of hemorrhage, are based upon the pathological fact that the infiltration of cell-growths into the alveolar tissue, and the consequent compression and obliteration of the bloodvessels rather prevents bleeding

than fosters it, while the liquefaction of the tubercle, resulting, as it does, from a necrosis due to an absence of blood supply, does not cause bleeding even when there is ulceration. No bleeding, it is argued, can be detected in acute tuberculosis, or where compact masses invade large tracts of the lungs when the infection is more local.

The only manner in which it is admitted that tubercle may result in pulmonary hemorrhage is when it may compress a portion of a very small pulmonary vein, block it up, and give rise to a slight capillary hemorrhage; but no instance of the actual rupture has been seen by the author, the usual effect of the blocking being a simple stasis resulting in streaks of black pigment. The opinion is expressed "that bleeding from the lungs appears to stand in no relation to the amount of tubercle, and is independent of it; but the presence of tubercle in large quantities, whether it be in the scrofulous lung or in any other form, would suggest the probability that the patient had not been subject to any copious attacks of bleeding during the time of the tubercular process."

The generally received opinion that tubercle is the cause of the hemorrhage is believed by the author to be due to misinterpretation of physical signs which are dependent upon the retention of extravasated blood in the lungs.

In the chapter on pathological traces of hemorrhage, some instructive coloured plates are introduced to exhibit the manner in which portions of the blood are drawn by insufflation into various parts of the lung. Other coloured illustrations represent the alterations which the inhaled blood undergoes after the lapse of a number of months. These changes are absorption, decoloration, fibrination, and calcification. It is denied that evidence has been adduced to show that putrefactive changes take place in these masses. Indeed, it is argued that the filling up of the alveoli, and the clotting in the bronchioles prevent any admixture with air and any special organism that might induce a septic condition; and it is intimated that any risk of the kind is due to the admixture of morbid secretions with the extravasated blood in its passage through the bronchial tubes.

The alterations undergone by the extravasated blood or by the blood residues, is regarded as the connecting link between blood-spitting and phthisis excavation of the lung. These masses may participate in the general destruction following phthisical excavation or liquefaction, at which time the addition of old blood pigment to the secretion from a cavity imparts a green tint to the yellow sputa. The fibrinous nodule left by the absorption of the outermost portion of the clot is believed to form the nucleus of initial softening far more frequently than is generally suspected.

Attention is drawn to the calcareous degeneration of old hemorrhagic nodules, and two characteristic illustrations are given of their aspect, as well as that of the capsules in which they are inclosed, or from which they escape by rupture when located in mobile portions of the lung.

Although the opinion is maintained that tubercle is not due to irritation excited by the extravasated blood itself, it is believed that the liquefaction of the hemorrhagic nodules engenders the risk of drawing portions of the softened products into other portions of the lung by the process of insufflation, and thus tends to the formation of tubercle by repeated acts of infection. The observer is cautioned against mistaking for tubercles certain small nodules, no larger than pin-heads, in the air sacs, and which are harder than tubercles and more opaque, and distinguished at once on microscopic inspection.

The special proclivities to pulmonary bleeding, as deduced from the author's observations, are hæmophilia or tendency to hemorrhage, plethora from imbibition of great quantities of beer or light wines, excessive heat of temperature, and alterations in the blood from the effect of various systemic diseases.

In a number of cases of phthisical families given in illustration, some of which comprise the records of four generations, epistaxis figures prominently as one of the manifestations of the hemorrhagic tendency, and occurred in many of the subjects of blood-spitting. The conclusion arrived at is that a special tendency to hemorrhage prevails in some families as the result of an inherited taint of phthisis. Since the author's attention became directed to the inherited tendency, he has rarely failed to establish the connection in all cases of bleeding where the hemorrhage has been copious, or has occurred during the early stages, or before any pulmonary disease could be detected, or has been due to trivial exertion.

In copious beer-drinkers and the like, it is contended that a hydropic degeneration of the tissues generally ensues, inducing a condition resembling hæmophilia, with a tendency to general capillary stasis, and actual degeneration of vessels in marked cases.

The remarkable predominance of hæmoptysis during the heat of summer, and under conditions of sudden elevation of temperature, is explained by the expansion of the vessels generally under heat, with consequent increase of intravascular pressure, and diminution of the tenacity of their walls. The importance of climate, and the temperature of dwelling-rooms is shown to be significant in this connection.

The influence of the use of wind-instruments on the causation of hemorrhage has received considerable study, and a number of interesting cases are outlined in an appendix. The author concludes from his own observations, that pulmonary disease is rare as a consequence of playing upon wind-instruments. Indeed, in some of his cases, the exercise of the lungs, consequent on their forced insufflation, appears to have really postponed the development of pulmonary disease which became established when the instrument had been laid aside.

The remarks on the treatment of pulmonary hemorrhage are judicious and commendable. Caution is inculcated against too great reliance upon actual styptics. Those most recommended are gallic acid with small doses of sulphuric or nitric acid, and opium; turpentine, inhaled from lint; and ergot in full doses (two drachms of the fluid extract), the liability to deterioration of the drug by keeping, rendering it often uncertain whether failure with it be due to faulty preparation, over keeping, or non-effect. Styptics are not thought of much avail in copious bleeding from delicacy of structure, and here good air is recommended, bracing and rather cold air, air inhaled after its passage over ice, and oil and ferruginous tissues. Stimulants, when necessary, are considered admissible only in the smallest possible bulk. In cases of general plethora, free purging, local and even general blood-lettings are recommended; and it is stated that some cases yield only to blisterings.

It is with great pleasure that we recommend the careful perusal of this valuable monograph, which we regard as evidence of real progress in the pathology and etiology of pulmonary hemorrhage.

J. S. C.

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ART. XXIV.—*Clinical Lectures on Diseases of the Urinary Organs, delivered at University College Hospital.* By Sir HENRY THOMPSON, Surgeon Extraordinary to H. M. the King of the Belgians; Emeritus Professor of Clinical Surgery, and Consulting Surgeon to University College Hospital. Fifth edition. 8vo., pp. 355. London: J. & A. Churchill, 1879.

It rarely falls to the lot of a man to store his writings with such wealth that the wisest of his contemporaries are content to mine there for the treasure which

they too would bring to the light. Such, nevertheless, has been the fortune of the author of these lectures. It is well-nigh impossible to write upon the subject of genito-urinary diseases, without referring either to his name or to his many valuable contributions to the special department which he has so well illustrated. Catholic in his investigation of the fruits of the labour of others, cautious in all his deductions, rejecting all specious theories in the effort to obtain practically useful results, as clever with his pen as he is with the sound or the lithotrite, one can scarcely wonder that he is esteemed the master that he is. Of Sir Henry's "searcher" it may well be said that it has proved to be a famous "finder."

At the same time, it would not be expected that the author could embody, in this fifth edition of his clinical lectures, the ripest fruits of his mature and rich experience. In point of fact, he has not done this, nor, under the circumstances, was it possible to do this. None but a great author and teacher should have the privilege of publishing clinical lectures in book form, and men of that high standing really need not do it. Clinical lectures belong to the department of transient literature, and are there best consulted. The author admits that none of the present lectures were written out by his own hand, but were all delivered in a colloquial style, and the words at the time reported phonographically. Thus, they originally appeared in the *Lancet*. They can, therefore, be fairly exempted from the standard of criticism to which a systematic treatise should be subject. In such a light, they deserve to be regarded as admirable expositions of the subjects considered, useful to the student, and occasionally suggestive to the man of broader experience and reading. As setting forth the views of a well-known author, they have, of course, a merit peculiarly their own. He, however, who has once enjoyed a reading of the author's work on the pathology and treatment of stricture of the urethra, and urinary fistulæ, or who has learned to appreciate the value of the researches which resulted in the Fothergillian prize essay on *The Prostate and its Diseases*, can scarcely fail to be here disappointed in finding, devoted to the same subjects, scarcely one-sixth of the space required in the treatises named.

The American reader of these pages will naturally seek to discover upon which side of the controversy now waging with regard to the male urethra, Sir Henry Thompson throws the weight of his great authority; nor will he seek vainly. The male urethra, according to our author, is "a continuous closed valve, capable of transmitting fluids and solids in one direction only, and transmitting nothing whatever in the opposite direction, except in obedience to applied force." With reference to those whom Sir Henry, viewing them collectively, names "the mechanical school," he practically condemns, with as much moderation as might be expected of one in his quasi-judicial position, all the knick-knacks and complex mechanical means which are by them used for exploration, incision, and other operations upon the urethra. In short, the weight of his authority is thrown in favour of that conservative recognition of the rights of the urethra, which is, we are glad to believe, making itself felt upon this side of the Atlantic.

Here, for example, is an apothegm, which might well be pressed to the consideration of many practitioners who have not given special attention to the diseases of the genito-urinary organs. It is a voice from one in authority, sounding from the land where every man's house is, by law, regarded as his castle:—

"All instruments are evils, more or less considerable, never to be resorted to unless a greater evil be present, which their employment may probably remedy" (page 42).

The fallacy of supposing every obstruction to the passage of an instrument which distends to its utmost extent the soft, sensitive, and delicate urethral

chink, to be necessarily a stricture, and to be treated as such, is well shown in the following paragraph (page 84):—

“Now, in considering this subject, I feel compelled to express the opinion that there is a tendency, at the present day, to employ instruments too readily; and instruments also which are liable to injure the urethra. . . . I may be allowed to say, perhaps, that my feeble voice has been raised against the abuse of instruments from the first day that I ventured to pen a line on the subject, some five and twenty years ago. And now I perceive a growing disposition to return to the state of things I have referred to. I note an increased tendency to discover stricture, and especially to undertake a considerable amount of operative treatment for strictures of the slightest kind, and sometimes in cases where, in my opinion, no strictures have existed. There seems now to be a school which has determined for itself a very high standard of patency in what we hear called “the urethral tube,” and which is accordingly said to have, or, if it hasn’t, that it ought to have, a calibre of so many parts, and very large parts, of an inch, or so many millimetres, as the case may be. Instruments of astounding magnitude are produced, and, if one of them cannot be passed, with an ease which contents the operator, through the whole of the urethra, the unlucky patient is pronounced to be the subject of stricture; and probably he is submitted to an operation by no means devoid of risk.”

This, and more of the same general character, is said by our author, in connection with a subject whose importance constitutes a plea for its extended consideration. We are tempted to make further extracts from the pages before us, touching upon the same points, but we have perhaps sufficiently indicated the tendency of Sir Henry Thompson’s opinions and the direction of his teaching. His clinical lectures will prove valuable in one way, if in no other, by aiding many who have been fascinated by the brilliant and delusive promise of the “tube system,” to return to that cautious prudence which should characterize every man who is a true physician.

Of course, it will be claimed by many that our author, guided by his conservative instinct, has neglected to make use of much valuable material that was at his hand. To this criticism, certainly, he is amenable. Many of the instruments for internal urethrotomy, as modified by our countrymen, deserved honourable mention, even in a collection of clinical lectures. Mr. Erichsen,<sup>1</sup> in the last edition of his comprehensive treatise, does not hesitate to do justice to the Otis urethra-meter and urethrotome, and Mr. Gant<sup>2</sup> is not unmindful of the value of the Van Buren-Gouley tunnelled shaft.

At the same time, it must be admitted generally that Sir Henry Thompson is prompt to make trial of everything which promises to be of the slightest benefit either to his patients or to his knowledge of their disorders, which are practically one and the same thing. More than twenty-five years ago, he first saw the endoscope, for example, in the hands of Mr. Avery, of the Charing Cross Hospital, and his well-known comment upon the possibilities of its usefulness, has stuck to it like a label ever since: “If a man has a good and tolerably practised hand, with a fair share of intelligence, I do not think he will gain a great deal by the endoscope; and if he has not, I think it will be of no use at all.”

We might point to another illustration of the rapidity with which our author seizes and tests the earliest indications of science in the direction which is to him the most interesting. Prof. Edmund Andrews was, without question, entirely original in his application of acoustics in the search for small fragments of stone, before and after the operation of lithotripsy. But he had scarcely devised, employed, and published<sup>3</sup> a description of his new auscultating sound, when Sir Henry

<sup>1</sup> 1878, pp. 854 and 864.

<sup>2</sup> 1878, p. 775.

<sup>3</sup> Chicago Med. Journ. and Exam., June, 1878, p. 597.

Thompson, almost at the same moment, upon the other side of the Atlantic, introduced into the bladder a sound with an attached microphone, and made audible to a number of assembled students the instant of contact of the beak of the instrument with the last remaining fragment of a crushed calculus. In his lecture upon this subject, as it appeared originally in England, the experimenter was made to appear as distrustful of the future of the microphone, in this connection, as he certainly was of the future of the endoscope.

It is to be regretted that our author should not have contributed to establish uniformity in the matter of the gauge of urethral instruments. He still reproduces (page 47) the wretchedly defective plate, which has done duty in earlier editions, as "the French or Charrière gauge," and, while praising his neighbours across the Channel for their "exactness," admits that the English measurements are arbitrary and without uniformity. It does not seem to have occurred to him that he was the very man, and his the great opportunity, to take a step which would largely contribute to bringing order out of chaos.

The typographical appearance of the work is all that could be desired; and the cuts are neither better nor worse than those which are to be seen in every American treatise on the same subject.

J. N. H.

ART. XXV.—*State Board of Health Reports.*

1. *Tenth Annual Report of the State Board of Health of Massachusetts.* Jan. 1879. 8vo. pp. 309. Boston, Mass., 1879.
2. *Sixth Annual Report of the Secretary of the State Board of Health of the State of Michigan,* for the fiscal year ending Sept. 30, 1878. 8vo. pp. lxi. 355. Lansing, Mich., 1878.

1. THE current number of the Massachusetts reports comes laden with an especial and melancholy interest. We hardly expect to be credited when we state that the Massachusetts Board of Health has made its last report! Considerations connected, we believe, with the question as to who shall be the next Governor, have led to some sort of dodge or movement, in the pretended interest of economy, for consolidating all the various Boards, Commissions, etc., into one. Of course it would be presumptuous folly to doubt for one moment that the voters of the Bay State, or its Governor, can find a body of men who shall be equally conversant with sanitation and lunacy, penology and pauperism, chemistry and metaphysics, poor-relief and ventilation. Elsewhere and formerly it has been supposed that different gifts were vouchsafed to different men, and in different measure; but we live and learn.

Dr. Clouston, Superintendent of the Royal Lunatic Asylum, near Edinburgh, contributes a paper describing what he considers an ideal hospital, adapted to the needs of this country, and to accommodate two hundred insane patients. Plans and drawings exhibit the several buildings of this somewhat composite design, both in their relations and in their individual structure. To some of us, it might appear like a rather bold undertaking for a person born and bred abroad, an entire stranger to this country, and never having, we believe, even visited it, to assume the position of instructing native Americans as to the construction of their hospitals. With every disposition to profit by tuition, we are compelled to acknowledge a misgiving that he has failed. Having no practical acquaintance with the ways, manners, and habits of our people, sane or insane, the social status of our patients, our climatic conditions, and, perhaps especially, the finan-

cial light in which all eleemosynary institutions are now very closely criticized, we need hardly say that the writer fails to hit upon such architectural arrangements as should meet the requirements.

Without going much into detail, we may say that Dr. Clouston's deviations from the commoner plans among us, consist in housing the patients in several buildings, about a hundred feet apart, and connected by glass corridors, which are also to be used as winter-gardens, promenades, smoking and exercising rooms, etc. If we understand rightly, all suitable patients, of both sexes, are to take their meals sociably in a large central dining-room, so designed as to give the effect of an arcade surrounded by a conservatory. The wards have, for the most part, rooms on one side only, with windows on the other.

That any advantage of sufficient magnitude to offset the grave objections to the plan is gained by dispersing the patients in the manner here contemplated, may well be doubted. Indeed we have personally no doubt in the matter at all. We hold that in hospital construction for the insane there should be provided every facility for the closest possible surveillance of the employés, especially the nurses. The further these are removed from the officers, the less efficient will be the supervision. In the matter of taking the daily food, we had supposed that the path of improvement lay in precisely the opposite direction to that here suggested. Knowing how offensive to others are the habits of certain patients at meal-time, we have approved the practice of some physicians in substituting for the one or two long tables, groups of smaller ones; thus carrying out the idea of classification, which, singularly ignored in this particular, is so zealously urged by Dr. Clouston in other directions. Indeed, it seems to us as if this matter of meals should be the very last in which the idea of grouping and separation is to be lost sight of.

As to expenditure, judging from the tone of public remark as to costly and "palatial" asylums, we are inclined to think that the *vox populi* would be uplifted against glass corridors, eight or ten feet wide and high, by eight hundred long, for each hundred patients, and fitted up as winter-gardens and smoking-rooms—which of course would imply, in our Northern States, some trifling outlay for fuel. Possibly a portion of the public might fail to grasp the relation between the welfare of the patients and any glass corridors whatever. If Dr. Clouston was at all fully aware of the outcry lately raised, all around us, against costly hospitals, we think he would have modified or omitted this feature of his plan, which at least can make no claims to be economical.

Two years ago there appeared in this publication an extremely interesting and instructive paper, upon the growth of children, presenting tabular statements of the heights and weights of school-children at successive ages. In addition to the principal aim of the observations, the ascertaining of the rate of growth as existing among Boston children, several curious points came into notice as side issues. The writer, Prof. H. P. Bowditch, now endeavours to ascertain the relative potency of *race*, and of *surroundings*, as causes of the superior stature and weight of the children of American parents as compared with those of foreign. It will readily be perceived that the "poorer" class and the "foreign-descended" class, to some considerable extent coincide among our population. It follows that there was, at first, difficulty in interpreting the results. Further investigations seem to show that both factors are active. Among Americans, English, and Irish, the progeny of the prosperous classes are larger and heavier than their less comfortable brothers. But, apart from this, race also has an influence scarcely inferior to that of abundant food, air, and the comforts of life generally. The small number of children of other than American or Irish descent led Dr. Bowditch in his own researches to consider only these two races. It is a significant fact, that



in comparing the poorer with the wealthier class, less difference of physique exists here than in Great Britain.

Prof. Edward Hitchcock sketches, in a very instructive manner, the admirable theory and practice of physical culture and hygiene as obtaining at Amherst College. The faculty justly deprecate that style of education which turns out the consumptive and short-lived graduate of serious aspect and pallid cheeks. For nearly twenty years physical culture has been attended to systematically, under the management of a special professor, who is a regularly educated physician. The aim is not so much to develop athletes as to make the average student healthy, hearty, active, free from dyspepsia, and fitted to work or to play with zeal and pleasure. The amount of actual illness is found to be decidedly less than before the exercises were enforced, to say nothing of the general constitutional improvement. The percentage of sickness decreases with the successive years of college life and study—less in Senior than in Freshman years.

Dr. Winsor treats briefly of the harm done by coal-gas when carelessly, or from imperfect arrangements, allowed to mingle with the air of our homes.

A thoroughly practical paper is the one by Dr. E. C. Clarke, on Common Defects in House Drains. The commoner faults, both of design and execution, are stated, and made clear by numerous wood-cuts.

Over one hundred pages are devoted to a verbatim report of a lawsuit—arguments, evidence, and all—between the city of Cambridge and the builders of a new slaughter-house. We scarcely see why so much space should be devoted to what our newspaper reporters call the “verbiage” of the case, even though it be one of great importance.

Dr. Cowles, of the Boston City Hospital, contributes a Study of Ventilation, giving the results of observations made by him in certain wards of the hospital. By ingenious apparatus, and still more ingenious sectional and ground-plan diagrams, he has ascertained and exhibited complete views of the eddies and currents produced in the rooms by various causes. The temperature and degree of humidity is also shown for different heights and lateral spaces, throughout the wards. From the report of the surgical results, no less than from the findings of the analytical chemist, we are led to suppose the diagrams do not mislead as to the exceptionally excellent diffusion and purification attained. The experiments were made in winter; we wonder if as good results were obtained in spring?

The report on the Health of Towns contains, as usual, many cases of supposed poisoning through contaminated water. A capital circular shows the public, by description and by drawings, the ways in which wells are liable to pollution.

2. The Michigan Board is eminently what is called in the West a “live” organization. It is constantly issuing circulars for popular use, upon prevailing epidemics, prevention of various diseases, different points of hygiene, treatment of sunstroke, apparent drowning, etc., plainly written in a condensed form, and spread broadcast over the State. From its health officers it requires reports of particular cases or epidemics, liable to endanger public health. Some of these reports are very instructive.

The Board modestly but justly congratulates itself on the almost entire freedom which Michigan enjoys from the elsewhere terribly frequent kerosene disasters. Its rigid inspection of oils has practically abolished these needless tragedies. One danger, however, says Secretary Baker, is not prevented by present law; a lamp perfectly safe under Michigan inspection will become dangerous *if the chimney be broken or removed*,—the metal around the wick soon becoming heated to a point higher than the test.

President Kedzie expresses, we believe, a great truth, in saying that the rela-

tions of climatic conditions to health will be better ascertained by studying meteorological conditions in connection with prevailing diseases, rather than with deaths from those diseases.

In a report on *Lead Poisoning by the Use of Tinned Ware*, etc., Dr. Kedzie states that an alarming adulteration is now very common, by which the wash or plating of tin, covering our common pans and cans, is not pure tin, but mixed with lead. Even tin-lined lead pipe, which we had supposed a safeguard against lead in the water, thus becomes of questionable use. The professor analyzed "bar tin," bought as chemically pure, and found lead in that.

The glazing and enamelling of earthen wares are both open to objection. The first often contains lead; the second cracks, and grease and other matter soak into the pores of the ware, putrefy, and become injurious to health. "Granite ware" he found free from poison; "marbleized ware" was found to contain much lead. By actual experiment, eight ounces of pure cider vinegar took up from a quart basin—marbleized—seven grains of lead in twenty-four hours. A great sanitary want is a perfect lining for kettles, etc., which is of innocent composition, and not liable to separate or crack.

Dr. Hitchcock, of the Board, takes but little space to show the perfect baselessness of the silly notion that tomato eating causes cancer.

The universal use, in Michigan towns, of plank sidewalks, and the frequent presence of large amounts of sawdust in the streets, has given rise to inquiries as to the sanitary influences of decaying wood. Generally, the testimony as to effects is not very definite. A suggestion is made that the turpentine in the cone-bearing trees neutralizes the effects of decay. One gentleman, however, decidedly states that malarial disease in the proportion of 12 to 1 exists in a sawdust-covered district of his town, as compared to a portion not so covered. A considerable excess of cholera infantum and diarrhoea is also noted. Here the sawdust is often overflowed. How much of the alleged facts may be due to other conditions does not clearly appear. Another correspondent believes he can recognize a connection between the sawdust and cerebro-spinal meningitis, though he does not speak with much confidence.

In a report of his attendance on the annual meeting of the American Social Science Association, we are sorry to see so sensible a man as Prof. Kedzie yielding to the notion that the so-called "cottage plan" is the best for curing the insane in this country.

Secretary Baker in his report of his attendance at the State Medical Society meeting, quotes, with tacit approbation, resolutions offered by Dr. J. H. Beech, and adopted, setting forth that the great frequency of homicide, suicide, and infanticide, by persons of impaired minds, should prompt to more care and more stringent regulations for the protection of the public and the afflicted ones from such lamentable results of their freedom. The moral responsibility of physicians, in neglecting to urge proper protective matters, is forcibly stated. It is represented that while the rights of alleged lunatics should be fully respected, honest witnesses should not be liable to legal prosecutions, and thereby deterred from doing a duty and a kindness, or punished if they venture to do it. Even where the case is doubtful, witnesses should not be prosecuted without strong evidence of malice. The resolutions go on to urge the members to warn the public of the frequent danger in keeping insane relatives at home. As a contrast to the vulgar and incessant cry about "incarceration," "conspiracy," and evil motives, these resolutions are refreshing, and should do good.

A report upon outbreaks of diphtheria is introduced by an earnest warning as to the contagiousness of the disease. In a house into which new tenants had just moved, and cleaned out a very filthy cellar, eight cases soon appeared, of which

four died, in a household of ten. The former family had had no trouble, though the cellar and house had been wretchedly filthy.

Another group of nine cases with six deaths occurred. No direct evidence of contagious origin is given. The cellar contained over a hundred bushels of potatoes, which were badly decayed. A candle would not burn on the floor, on account of accumulated carbonic-acid gas. It is suggested that the more deadly oxide was probably present. The water used by the family was intolerably offensive. Two rods south was an unoccupied house with 700 bushels of decaying turnips in the cellar. The inner walls of the occupied house, moreover, were damp from new plastering. From this group, six persons, adults, mostly young, contracted the disease. These, in turn, apparently infected seven children of two of the women, an unknown number of children of the physician, and two children of the second physician. Other additional cases are mentioned as doubtful. Apparently the first family had caused disease in 23 persons. A table here given is said to foot up 35 cases, with 12 deaths; we can make of it only 28 cases.

Another physician reports his knowledge of 73 cases in three adjacent townships—40 in his own practice. Formerly a sceptic as to contagion, he is now fully converted. He traces all the cases to two families. The mortality in this group is not given; in the others it was very heavy.

An admirable popular tract, of three pages, on diphtheria, for popular instruction in prophylaxis, hygienic treatment, disinfection, etc., is here printed.

Another of the practical benefits of the Board appears in the form of an essay on the care and preservation of the teeth. It can be read in ten minutes by the plainest farmer's wife, and if heeded will produce incalculable good. The importance of attention to the deciduous teeth is enforced, in relation to the shape of the jaw, and the position and proper shape of the permanent teeth.

Dr. Lyster has prepared a very good article on the climate and topography of the lower peninsula, or main body of the State. By the numerous maps presented, we see that the climate is curiously varied and modified in different parts. The great lakes which surround the State, in their relations with the most prevailing winds, are probably the principal cause of the eccentricity of the isothermal lines. Dr. Lyster believes, however, that the western winds from the warm Pacific shore do not part with all their warmth in crossing the mountains, but are still able to soften the climate of the lake, and the western shore of Michigan.

B. L. R.

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ART. XXVI.—*Diseases of the Bladder and Urethra in Women.* By ALEXANDER J. C. SKENE, M.D., Professor of the Diseases of Women in the Long Island College Hospital; Fellow of the American Gynecological Society, etc. 8vo. Pp. viii., 374. New York: William Wood & Co., 1878.

A BOOK handsomely printed on good paper, large type, broad margins—the last quite convenient for annotations—its author one of the most painstaking, industrious, conscientious, and eminent members of the American profession, is sure to attract attention. Moreover when the subjects of which it treats are brought under the daily observation of physicians, and are often exceedingly difficult as to therapeutics as they are in diagnosis, the volume is sure to keep the attention which its handsome appearance and the fame of its author have attracted.

Dr. Skene is to be congratulated upon supplying an urgent professional want. We have been looking for this book these many years—nay, longing for it as one anxiously waiting for the morning.

Having ardently desired its coming, and being sincerely grateful that it is actually here, it may seem ungracious to write aught but praise of Dr. Skene's handsome volume, and indeed praise, much praise, can be, should be given. But because the book is good we would have it better; because it fills a vacant place in professional libraries, and must be classed a permanent addition to medical literature, we desire it best. Therefore we shall not hesitate, in justice alike to its honest and able author, and to the profession, to point out some of what we believe its faults, confident that all just criticisms will inure to the value of the book when its second edition appears.

Sidney Smith suggested that it was taking unfair advantage of an author to read his book before reviewing it, the reviewer might thereby become prejudiced! Nevertheless, we have read Dr. Skene's book not once, but twice, and hope we have escaped all prejudice.

In his preface the author states that the lectures which form the volume were originally intended only for the students whom he taught, but the absence of any systematic work, in the English language, on diseases of the female urethra and bladder, led him to believe that the publication of these lectures might be of service to others. Probably the work would be better received by the profession if it were not in the form of lectures. That change made, the "we" which is almost exclusively an editorial prerogative, could hardly find the foremost place it now does; such expressions as "we will now take up and dispose of," and "that you and I may understand each other clearly," and calling blood the "hæmatic fluid," would not be tolerated by a man sitting down to the severe simplicity of clear, condensed, plain writing, intended for the reading of doctors; nor would he retain "your anatomies" as the equivalent of your works on anatomy. However, the book now is in lectures, and these lectures we shall briefly refer to in their order. The first is upon *the anatomy of the bladder and urethra, their anatomical relation, function of the bladder, development and malformation of the bladder and urethra*. It would seem according to a natural order in the study to place the development first. However, this is not so material, possibly indeed is a doubtful point. The lecture occupies forty-six pages, has a few illustrations, two of which are taken respectively from Gray and Savage, and is a faithful presentation of the topics mentioned above. However, we do not believe that plexi, p. 8, is the plural of plexus, or that gain is properly substituted for have in the following: "Nerves gain their origin." The following is a sentence found on the second page: "The conflicting views of various authors regarding unsettled questions will, when necessary, be omitted, to make room for the more practical points which you are expected to carry with you to the bedside of your patients." Why *various* authors, and will not opinions be conflicting upon unsettled questions? Would not "to the bedside" be sufficient,

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' In the Comedy of Errors we read:—

"They brought one Pinch, a hungry, lean-faced villian,  
A mere anatomy."

And in King John—

—— "Rouse from sleep that fell anatomy,  
Which cannot hear a feeble lady's voice."

In Disraeli's *History of the Skeleton of Death* the following sentence is found: "It was at this period that they first beheld the grave yawn, and Death, in the Gothic form of a gaunt anatomy, parading through the universe!"

Surely when Dr. Skene says to students "your anatomies," he forgets his Shakespeare, and also Disraeli's essay. It would be rude to ask whether the "your anatomies," which the students could not help having with them, were "mere," "fell," or "gaunt." It will not do to take a word in use in general literature and give it an entirely different signification in medicine.

without "of your patients?" The words "when necessary" placed where they are, indicate a very different meaning from that intended by the author. There are several sentences in the book equally open to criticism.

In the first sentence on the next page we have the superlative twice used where the comparative should be. On p. 19 we read, "Neither limpid nor concentrated urine are well borne by the bladder," and a few sentences above, "a very thin secretion of mucous," is spoken of. On p. 62, "Neither are to be used in any amount." But these, and many similar errors, are probably to be set down, as "urien," "urethre walls," and "*Archives General de Medicin*," etc., to the blame of that unknown individual, the proof-reader. So, too, to this same proof-reader a reckless extravagance in the use of capitals must be attributed; scarcely a page in the book that is not disfigured by the violation of a plain rule and general practice as to capitalization. But we are not willing to blame him with the blunder of concluding a sentence by parenthesis, and the jumble of Latin and of English in the following: "Good effects have followed the use of rectal injections containing Chloral Hydrate (grains 15 to aqua 5j or 5ij)."

We confess to not always understanding the Latin found in this book, as on p. 33, last clause of the following sentence: "This must be distinguished from *Inversio Vesicæ cum prolapsu per urethram*, and *Exstropia* from *per urachum*." Again, p. 39, what does "*inversio vesicæ fissuram*" mean? If Latin must be given in our text-books, by all means let it be given correctly.

Not only in this lecture, but in some of the others, several authors are referred to, but rarely<sup>1</sup> are page and volume given, and this neglect does not permit those of Dr. Skene's readers, who desire, to consult original sources. On p. 48 we read: "You will find the result recorded by Podruzki." Did any of the students who heard this lecture consult Podruzki's record? Who is Podruzki? Doubtless there is such a man as surely as there was a De Sauly.

"—— Ambulant on Tellus,  
Bifid-cleft like mortals, dormant in nightcap,  
Having sight, smell, hearing, food-receiving feature  
Three times daily patent."

But then where is his local habitation, and in what volume, in what annual, quarterly, monthly, or hebdomadal was "the result recorded by Podruzki"?

The second lecture is chiefly occupied with *functional diseases of the bladder*, but concludes with *extroversion of the bladder through the urethra*. The lecture is excellent, and contains much practical instruction. On p. 54 Dr. Skene refers to what he terms "malarial fever of the urethra." That there is such a disease most practitioners will doubt, and attribute the symptoms, which according to Dr. S. characterize it, simply to derangement of the urinary secretion consequent upon malarial poisoning. On p. 100 an illustration of Dr. Skene's pessary for cystocele is given. The late Dr. Churchill used a Hodge pessary, first giving it an additional anterior bar, and we have sometimes used an inverted and reversed Smith's pessary, but Dr. Skene's instrument is very much better than either plan.

The third lecture is upon *organic diseases of the bladder, urinalgia, exploration of the bladder, vesical hyperæmia, and hemorrhage*. The wood-cuts, pp. 114-117, illustrative of the microscopic appearances of urinary deposits, are poorly done.

<sup>1</sup> Sometimes, indeed, the reference is not given correctly. Thus, p. 64, a reference is made to the *Lancet*, p. 4, vol. xii. 1875. The publication of the *Lancet* was commenced in 1824, and two volumes are issued annually. How then can there be a twelfth volume in 1875?

On p. 124 the author remarks that for "physical exploration of the bladder and urethra," he has devised "an Endoscope, which, to the investigator of bladder and urethral diseases, has proved to be what Sims's Speculum is to the gynecologist." Then follow illustrations and a description of the instrument thus highly commended. Various other most useful instruments, requisite either in the diagnosis or treatment of vesical and of urethral diseases, Professor Skene has devised; indeed he has proved himself peculiarly expert in ingenious and practical devices, though we cannot fully endorse the compliment<sup>1</sup> bestowed upon him by a cotemporary.

The fourth and fifth lectures, probably the most valuable in the volume, are upon *cystitis*. These two lectures are worth the price of the entire book. The treatment of cystitis occupies between twenty and thirty pages replete with useful information, much of it indeed original. But after this discussion several paragraphs are devoted to *prognosis* and to *hygiene*. Surely these topics should be presented first.

*Vesico-urethral fissure* occupies a few pages, and nowhere can a better exposition of the subject be found.

The sixth lecture is upon *neoplasms, foreign bodies in, and hypertrophy and atrophy of the bladder*. In referring to foreign bodies in the bladder, Dr. S. speaks of pessaries badly fitted or worn too long, passing by ulceration from the vagina into the bladder; but he does not mention the fact that in some instances the physician has committed the error of introducing the pessary, Hodge's open lever, through the urethra into the bladder.

*Diseases of the urethra* are considered in the seventh and eighth lectures. On p. 272 the author gives a representation and description of a simple but ingenious and useful instrument devised by him, called a *reflux catheter*. By this instrument he douches the inflamed urethra with hot water, and finds the instrument quite useful. In discussing prolapse or inversion of the urethral mucous membrane, Dr. Skene states that the few cases of this disorder he has seen were in women over fifty years of age. In contrast with this statement is our own experience, for we have seen only two cases, and these occurred in girls under ten. Certainly, too, that experience would not justify the temporizing treatment which Dr. Skene proposes first, such as reduction of the prolapse, rest in bed, and the local use of astringents. Once a decided prolapse has taken place there is, in our opinion, but one remedy, and that is extirpation. We do not think the author devotes enough space to this operation, and we believe the method of Sequin ought to be presented in such connection—it certainly is ingenious and gives good results.

In an appendix the operation of Dr. Daniel Ayres for a case of extroversion of the bladder is given. Finally, a complete and convenient index concludes this most useful volume.

T. P.

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<sup>1</sup> "His instruments are ingenious and to the purpose, and in describing their uses in the physical exploration of the bladder he is *tuto, cito et jucunde*." What can be meant by asserting that Dr. Skene in the exercise of his descriptive or other powers, or under any conceivable circumstances, is three Latin adverbs!

ART. XXVII.—*Transactions of State Medical Societies.*

1. *Transactions of the Ohio State Medical Society.* May, 1878, pp. 228. Columbus, Ohio. 1878.
2. *Transactions of the Medical Society of the State of Tennessee for 1878.* Nashville, 1878.
3. *Ibid.* for 1879. Nashville, 1879.
4. *Transactions of the Kentucky State Medical Society.* April, 1878. Louisville, 1878.
5. *Transactions of the Medical Society of California for 1878 and 1879.* Sacramento, 1879.

1. In the address of retiring President Dr. W. H. Philips, of the *Ohio Society*, expert testimony is considered. We are not prepared to deny that great evils attend the employment of such testimony, or what is offered as such—before our American courts. Brief description is given of methods used in other countries for getting the benefit of expert witnesses. Dr. Philips favours the German system, in which regular medico-legal officers are permanently appointed. A county physician and a county surgeon constitute the tribunal to which all questions of medical jurisprudence are referred by the courts. These gentlemen have shown their familiarity with the subject, and their high attainments generally by passing a rigorous examination, before a Supreme Medical Commission. If the two disagree, or if appeal is made against their opinion, the question passes to a medical commission, one of which exists in every province. A second appeal may be had to the supreme commission, before named. From this body appeal lies only to the Minister of Medical and Sanitary Affairs. The first, or lowest, tribunal makes personal investigation of facts, and may call to their assistance other physicians who have passed the State examinations, and received certificates of skill in the particular specialty involved in the case. The duties of our coroner are also discharged by the two county officials. All this seems to be admirable—for Germany; but impracticable here, where permanency in political office is unknown.

Dr. Muscroft believes the local usefulness of the subsulphate of iron, or “common green vitriol,” has not been fully known. He finds it very useful, not only in erysipelas, but in chronic ulcers, eczema, nasal catarrh with fetid discharges. Used upon wounds, it is antiseptic, disinfectant, and styptic; and when in strong solution for the last purpose not nearly so painful as some other salts.

Dr. C. H. Reed believes quinia to be a true prophylactic as to scarlet fever. Discussion revealed considerable scepticism, on account of the singular vagaries of the disease, and the tendency to fallacious reasoning in such matters.

By using “heroic doses” of the same drug, Dr. Franklin says he lost only one case of yellow fever out of forty-four.

In a report on the progress of medicine, Dr. Loving mentions the fact that in Illinois a law recently passed to regulate medical practice has already produced a stampede of six hundred self-styled doctors who did not care to comply with the requirements. It may be fairly inferred that they left their country for their country's good.

2. In the *Tennessee Transactions* for 1878, Dr. Richard B. Maury directs attention to the frequency of severe hemorrhage after delivery, from the less considered accidents of parturition; such as lacerations of the cervix, vaginal walls, perineum, and external orifice of the passage. His object is to distinguish this class of blood-losing from that occurring between the placenta and uterine walls.

Dr. S. M. Thompson reports a case of ovariectomy, in which, preparatory to the

ultimate operation, first 58 and again 42 pounds of fluid were removed by two "tappings." The removal of the cyst was done in the open air, two days after the last tapping under chloroform. It was unilocular, and after being emptied of its contents, weighed seventeen pounds. The abdomen was "sponged out," wound closed by five or six sutures, very long adhesive straps, etc. The shock was marked, but under very free (and judicious) use of morphia, with a little whiskey, perfect union took place in six days, and the sutures were removed. We should have mentioned that, under a discretionary order, the patient received an indiscretely large dose or doses, of *veratrum viride*. Pulse and temperature respectively did not exceed 84, and 100°. The double ligature of saddler's silk was cut off short and left wholly within the abdomen. In twenty days after the operation the woman was seen working in her garden.

Prof. Duncan Eve, of the Nashville Medical College, reports an apparently successful operation in a congenital case of occluded or undeveloped anus, with fistulous communication with the vagina. Further observation is wanting to establish the reality of the cure.

Prof. Roberts, of the same school, advances the idea that the essence of the diphtheritic dyscrasia consists in the consumption of needed oxygen by the morbid fungoid growths, which should have been expended in the purification of the blood and destruction of effete material.

As may be supposed, the treatment advocated is almost purely constitutional. The strongest liquid nutriment, with strong, good coffee, well sweetened and mixed with cream, are deemed all important. Perhaps the secret of the author's alleged success is to be found in this sentence—"When I say I give them nourishment freely I mean that I make them take it. If not *per vias naturales*, then by enema." Quinia is early given if, as he says is usual, a malarial tendency exist, or if the bodily temperature be high. The night hours are deemed most available for the curative exhibition of this drug. Chlorate of potash, lemon juice, and honey are given. Alcohol is discarded upon the idea that its use diminishes the oxidizing powers of the blood.

A most appreciative obituary sketch of Prof. Paul Fitzsimmons Eve, M.D.; adds to the value of this publication. Dr. Eve fell dead while visiting a patient. He was about 73 years of age; had felt somewhat feeble and unwell previously, but declined to rest, saying he would rather wear out than rust out.

3. In the *Tennessee* pamphlet for 1879, Dr. Penn advances a theory, not too well defined,—as to a connection between the malarial fevers and a disturbance of the bodily electricity, which he seems to attribute to free evaporation of watery vapour.

A statement made by Dr. Lindsley, is, we fear only too true, that eye disease is co-extensive and correspondent with early book education of our lads and lasses. Too early application to printed lessons, and faulty arrangements of light in school-rooms, are chiefly blamed for the existing tendency.

Dr. Thornton, of Memphis, believes that yellow fever attacks the patients a second time much more commonly than is usually supposed. He has had personal experience of a second illness, and therefore is at least entitled to a respectful hearing. He thinks the disease is essentially what Dr. Jacob Bigelow calls "self-limited," and of course advocates such treatment only as shall be palliative as to distressing symptoms, and supporting as to the vital powers. He believes a blood-poisoning by a peculiar miasm exists; and the indications are to support the constitution through its terrible ordeal, and to assist reaction and recovery. Quinia he advises only at the very outset of the disease, if at all. Later, he deems it absolutely harmful. Diaphoretic measures, external and internal, and diuretics are advocated. Ice and ice-water are not recommended. To regard



this fever as "malarial," in the common acceptation of the term, our author regards as a mistake in theory and very hurtful as to practice. An instructive table is presented of the recorded details of 143 cases. Pulse, temperature, and brief circumstances are here shown in tabular form. The pulse seems often remarkably low as related to the temperature. With the latter at  $103^{\circ}$ ,  $104^{\circ}$ ,  $105^{\circ}$ , and even  $106^{\circ}$ , the former sometimes did not reach 90, even in fatal cases. Some cases only occasionally reached 80. One patient who recovered, in spite of black vomit, shows the following record on successive days: 1st, 72 and  $105^{\circ}$ ; 2d, 88 and  $104^{\circ}$ ; 3d, 60 and  $102.5^{\circ}$ ; and later, never more than 84 and  $101\frac{1}{2}^{\circ}$ . Another case, fatal, had a pulse never over 72, and at times 64. In a "recovered" case, 60, 70, and twice 62, with 92 as the maximum. A negro of thirty went through the disease successfully without getting a pulse above 70.

Dr. Hope, of Chattanooga, disbelieves in the direct contagious communication of the yellow fever. Several other brief papers indicate the great attention unhappily given of necessity to the subject. And a noble list of martyrs attests the devoted bravery of the local and neighbouring medical men in combating this terrible pestilence. Sad it is to know that this year is repeating the dread history of 1878.

4. The modest pamphlet from the *Kentucky Society* is very brief. The chiefly noticeable point is an appreciative and well-written memorial of the late Dr. Yandell, Sr., by Dr. Cowling; Dr. Eve, too, formerly of this State, receives a fitting tribute.

5. President Orme, of the *California Society*, in an able address, deals with the great modern evil of adulteration; with preventive medicine; and with the culture of the cinchona tree in California. The propagation of the eucalyptus tree, and the establishment of a botanic garden are here also advocated. A State medical library, as well as a State hospital for consumptives, are urged, it seems to us, with less reason.

Some useful records of climates in the various counties, stretching so far from north to south, and climbing from the shore up to the summits of the foot-hills, are of value to the invalid or to his adviser.

A somewhat long paper by Dr. Barkan, on the "Relations Existing between Diseases of the Eye and General and Special Diseases," is instructive. The writer states that it is, to some extent, an abridged translation from Foerster, of Breslau.

B. L. R.

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ART. XXVIII.—*Diseases of the Throat and Nasal Passages: A Guide to the Diagnosis and Treatment of Affections of the Pharynx, Oesophagus, Trachea, Larynx, and Nares.* By J. SOLIS COHEN, M.D., Lecturer on Laryngoscopy and Diseases of the Throat and Chest, in Jefferson Medical College, Philadelphia, etc. etc. Second edition, revised and amended. 8vo., pp. xviii., 742. New York: William Wood & Co., 1879.

THIS excellent work is again before the profession in an edition which has been enlarged by 160 pages of printed matter and 75 new wood-cuts. Instead of fifteen chapters we now have seventeen. The chapter on Sore Throat from Burns and Scalds has been omitted, whilst chapters on Chronic Sore Throat, Affections of the Septum Nasium, Surgical Operations upon the Larynx and Trachea, and Affections of the Laryngo-Pharyngeal and of the Glosso-

Epiglottic Sinuses have been added. The anatomy and histology of the larynx, as well as the description of the nasal mucous membrane, have been omitted. In many chapters we notice amendments, omissions, additions, and a more methodical arrangement of the various subjects treated of than in the previous edition. At the end of the volume the pages devoted to bibliography have not been reprinted, because, as the author states in his preface to the second edition, "it would have sacrificed many pages devoted to clinical use, and has become the less necessary on account of the appearance of copious references in the collateral portions of Ziemssen's *Cyclopaedia*," and in the current reports supplied to well-known medical journals by Prof. Lesserts and Drs. Knight, Porter, and Sémon. Although, as we have stated above, certain anatomical and physiological details have been omitted in this edition, which appeared in the first, yet the author has wisely introduced in certain portions of his greatly improved work, facts taken from Luschka and other foreign authors, with respect to the intimate structure of the organs treated of, with which the close and accurate student could hitherto alone become familiar. We notice the absence of several familiar illustrations which appeared in the first edition, but we have as a compensation many new ones introduced into the body of the work, which materially add to its value. In spite of the appearance of several new works on diseases of the throat within the past two years, we continue to believe that the work of Cohen is really needed by practitioners as a reliable guide to the diagnosis and treatment of these and allied affections. Dr. Cohen has had a very extensive experience in the practice of his specialty, and is, therefore, perfectly authorized to speak in an *ex cathedra* manner. This he does, as he himself expresses it, in accordance with "an honest endeavour to interpret facts and observations as they appeared in the light of his own understanding," and as an outcome of this way of doing, he has made the best book on the subjects treated of in the English tongue, in fact we might say without any exaggeration, the best treatise on the throat that has yet been published in any language. His symptomatology is usually complete, his anatomy and pathology fully up to the times, and his therapeutical counsels always manifold and judicious. Wherever we turn in this work, we find the evidence of conscientious and thorough investigation. Dr. Cohen has not contented himself with his own great mine of clinical research, he has also properly utilized the important facts made known by contemporaneous writers. But notwithstanding he has done this, he has so stamped his work with his own impress, that it obviously belongs to him, not as a compilation of what others have done, but as a candid exposition of a great deal of his own efforts and results.

Thus it is, that a work is in our hands, so different from many others nowadays, that it is indeed "a record differing in some respects from the records of others," but is also one written *de bonne foi*, and which characterizes a sturdy pioneer in the cause of truth and science. We cannot sacrifice space to a detailed examination of the numerous excellences contained in the various chapters, and we shall, therefore, content ourselves with a few allusions to the additions and amendments which have most forcibly struck us in the perusal of this volume. After a succinct description of acute tuberculous sore throat, an affection which the author has never seen, the following interesting case is narrated:—

"I have seen one case of acute phthisis commencing with acute laryngitis, attended with febrile phenomena of distinctly remittent type, occurring in a sailor, twenty-six years of age, after a few days' exposure to severe weather on shipboard. It terminated fatally in two weeks. The lungs were studded with tubercles as were the liver and some other organs. The larynx exhibited a series of follicular ulcerations, similar to those observed in cases of the ordinary ulcera-

*tive laryngitis of tuberculosis; but careful microscopic examination failed to reveal any deposit of tubercle in the larynx."*

The italics are our own, but as we have had occasion to observe a very similar condition of things three or four times in as many years, during our service in a large city hospital, we are glad to have corroborative proof of our own conviction, viz., that acute miliary tubercle does not become developed in the laryngeal structures.

We do not see the improvement in naming chronic *follicular pharyngitis* chronic *folliculous sore throat*, and we are forced to criticise the stress laid upon the cauterization or splitting of each enlarged follicle as a satisfactory method of treatment. These, and similar curative measures in this disease, are based, in our opinion, upon an erroneous conviction with respect to the true significance of these follicles, whose hypertrophy does not always afford proof of a diseased condition. In many instances, we are satisfied that they had better be permitted to remain in a perfectly quiescent state, instead of being inflamed with nitrate of silver, or London Paste. An interesting page (212) has been properly given to deformative adhesions of the soft palate, and our only regret is that the author did not consider it advisable to give us his experience more at length, in the surgical treatment of these troublesome conditions. Just in proportion as we find certain subjects insufficiently spoken of, or not described at all, in classical general works of medicine and surgery, do we expect and wish to find them fully narrated, and perhaps illustrated, in special books, and are always disappointed whenever our just expectations are not entirely satisfied. Under the head of Treatment of Adenoma at the Vault of the Pharynx (p. 262), the author gives a wood-cut of his pharyngeal cutting forceps, which is modelled upon a somewhat similar instrument of Mackenzie, and which is employed by him to cut off laryngeal growths. The shank of Dr. Cohen's instrument is curved, so as to be adapted to the parts where it is manipulated. "When the vegetations have been long I have been able," says the author, "to pass a wire loop over them, introduced through the nostril, and then drawn the free ends through a Gooch's canula, and thus cut them through." He is far more positive than formerly in regard to the power we have of so completely destroying these vegetations, as to render their repullulation most improbable. The article on Tuberculous Laryngitis is one of the most complete of the entire work, and reflects great credit upon the writer, as being a lucid, and, we believe, correct summary of a very much debated, and, until the appearance of this work, somewhat obscured disease. We are glad to find in this edition sections upon "Primary Chondritis and Perichondritis," "Lupus," "Lepra," and "Hypertrophy of the Larynx."

The appearance of the Larynx in Lupus (Tuerck) is given graphically at page 519, and that in Leprösy (Elsberg) at page 532. The cases of Elsberg are still fresh in the minds of many readers, as having appeared in full in the *Med. Record* (Jan. 4, 1879), to which they are referred. In the article upon Stenosis of the Larynx and Trachea, Schroetter's method of dilating stenosis of the larynx is well described, and a good illustrative figure (p. 591) accompanies the description. In speaking of this method of overcoming laryngeal stenosis by dilatation, the author states that he lacks personal experience in the procedure. In the cases reported by Schroetter and others, although some have been entirely cured, others have been compelled to wear the canula indefinitely, and were only in a certain degree ameliorated.

In place of a section on "Aphonia," which is, properly speaking, the term applicable to a symptom, we now have a complete article on the "Motor Paralysis of the Larynx." The surgical operations upon the larynx and trachea, such as laryngotomy, tracheotomy, catheterization, and exsection, are succinctly de-

scribed. We would have liked to see a wood-cut of Gussenbauer's artificial vocal apparatus appear rather than Luer's pea-valved tracheotomy tube (p. 679), which we can scarcely consent to believe is "noiseless and attracts no attention." A much more complete index than the one of the first edition is found at the end of the work. The type, illustrations, and general appearance of the work are most creditable to the publishers.

In concluding this criticism of a work of so much merit and so few imperfections, we take a just pride in recommending it most heartily to practitioners and students. It is far better to purchase a work of this kind and have a really sufficient idea of the diseases of which it treats, than to stock one's library uselessly with a smaller work which, though cheaper in the beginning, gives no adequate information and cannot be referred to with the hope of surmounting difficulties.

B. R.

ART. XXIX.—*A Manual of Psychological Medicine, containing the Lunacy Laws, the Nosology, Ætiology, Statistics, Description, Diagnosis, Pathology, and Treatment of Insanity. With an Appendix of Cases.* By JOHN CHARLES BUCKNILL, M.D. Lond., F.R.S., F.R.C.P.; formerly Lord Chancellor's Visitor of Lunatics; and by DANIEL HACK TUKE, M.D., F.R.C.P., Joint Editor of "The Journal of Mental Science;" formerly Lecturer on Psychological Medicine at the York School of Medicine, and Visiting Physician to the York Retreat. Fourth edition. 8vo. pp. 815. Philadelphia: Lindsay & Blakiston, 1879.

THE third edition of this valuable work having been somewhat fully noticed in the October number of this Journal for 1874, we propose to comment upon little else than the changes made in the matter or the arrangement since that date.

In the first chapter, upon Legal Enactments, legislative acts are more fully quoted, and the later laws are added. We do not understand why the authors have omitted, in this edition, a guarantee proposed in the third for the protection of the signers of certificates of insanity. Some such measure is certainly needed, but is possibly impracticable. On the subject of classification—always one of great difficulty—considerable change has been made.

The remarks on "Moral or Emotional Insanity" are considerably altered, with more copious quotations. Indeed, the chapter has been pretty thoroughly re-written. The first impression received is, that the writer is skeptical as to the existence of insanity without intellectual disturbance. Finally, however, he guardedly admits the possibility of such cases; but says that "sooner or later" intellectual derangement will almost always appear—if closely looked for. That may be true enough in general; but the writer's experience must have been exceptional if it has not shown him cases where for months, or even years, no impairment of intellect can be detected that would warrant a certificate and a committal to a hospital.

Under the heads of Pathology and Histology, the results of recent observations are the cause of various alterations in the text. In enumerating the changes which may be found in minute cerebral bloodvessels, vitreous degeneration is a condition first mentioned in this last edition. A reference to thickening of the coats of the small vessels omits, in this edition, mention before made of the longitudinal fibres. In naming the morbid changes of the cerebral cells, simple atrophy, mentioned in the former edition, has no place here.

Under "Treatment," the paragraphs on chloral-hydrate seem to have been

wholly rewritten. The author regards it as a valuable adjunct, or palliative; though it is not easy to tell exactly how highly he esteems it. At all events, in this edition, he places it below the bromide of potassium in therapeutic value, whereas, formerly, he seemed inclined towards a different estimate.

We looked with some curiosity into the chapter on Restraint, hoping that the progress of opinion since 1874 might have produced some noticeable change; but not a word added or omitted did we find. That Dr. Bucknill should be strongly impressed with the correctness of his views on this subject, and bring forward all possible arguments in their favour, is natural enough, and we would be the last to object to it. What we do object to, however, is that his manner of presenting these is that rather of the advocate than of the judge. The student has a right to expect, in a work like this, a full and candid discussion, in which both sides of the subject should be fairly presented. For anything he sees here, he would never suppose that the practice of complete non-restraint is regarded by many who have had as long an experience as our author, as a grave mistake; believing the arms of attendants to be a poor substitute for some simple apparatus in canvas or leather, and, indeed, often ineffectual and sometimes causing grievous injury to the patient. Should not the reader have been informed that the extreme non-restraint practice has found few advocates in France or Germany, and none at all among the hospital men of this country, while in Great Britain much of the support which it received—and which is far from being unanimous—is founded rather on a deference to a popular sentiment than upon sincere convictions of its real superiority.

In the revision, every sentence and even every word seems to have been critically examined. As a whole, the volume is a monument of faithful, conscientious work; although, as before stated, we think that upon at least one matter it is somewhat unfair—we are sure, unintentionally.

B. L. R.

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ART. XXX.—*On Regressive Paralysis (Infantile Paralysis. Spinal Paralysis of Adults)*. By WILLIAM H. BARLOW, M.D. 8vo. pp. 88. Manchester: J. E. Cornish, 1878.

UNDER the title of Regressive Paralysis the author considers the disease heretofore known as infantile paralysis or myelitis of the anterior horns. He has selected this name because it expresses one of the most prominent features of the affection; that is, the retrocession of the paralysis which always takes place in every case. The name is a good one, but it is hardly worth while to rechristen a disease which is well known by other equally appropriate terms. The brochure is based upon sixty-three cases of the infantile form of the disease, which have been carefully studied and analyzed. The author's conclusions confirm those of previous observers in almost all particulars. The paralysis he believes to be reflex in its nature, but he accepts the views of Charcot as to the morbid anatomy of the disease. He has remarked the influence of season in the production of the paralysis, and finds that of 53 cases 27 occurred in the months of July and August. This fact taken with the universal observation that children between the ages of one and two years are most liable to the affection, led the writer to the conclusion that the disease was reflex in character; for he says it is "at this age that the nervous system is most excitable, and when from the process of development, and the evolution of the teeth the whole system is most readily affected by outer influences, when diarrhœa, convulsions, and other reflex troubles are most com-

mon," and in the months of July and August children are most liable to diarrhœa and other disorders of a reflex character.

Nothing new is suggested in the way of treatment except a light apparatus as a substitute for the "heavy Scarpa's shoe." The idea of a light apparatus is most excellent, but we are unable from the description to make out what the instrument is like.

The cases are detailed at length at the end of the paper. Some are rather doubtful examples of spinal paralysis. For instance Case 5, in which there was left hemiplegia with right facial paralysis, and all the muscles responded to the Faradic current, or Case 30, where, after convulsions, there was also left hemiplegia with palsy of the right side of the face. These cases look like paralysis from a cerebral lesion.

All contributions to the literature of so important and interesting an affection as the one before us are very desirable, and we congratulate the author upon the thorough and painstaking manner in which he has done his work.

W. S.

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ART. XXXI.—*Die Hautkrankheiten für Aerzte und Studirende dargestellt von Dr. GUSTAV BEHREND, pract. Ärzte in Berlin. Mit 28 Holzschnitten. 12mo., pp. 569. Braunschweig. Verlag von Friedrich Wreden, 1879.*  
*Skin Diseases Described for Practitioners and Students. By Dr. GUSTAV BEHREND, etc,*

DR. BEHREND does not, we believe, hold any public position, and he is known in this country only as an occasional contributor of papers upon diseases of the skin to the medical societies and journals of Germany. He tells us in his preface that although the book was undertaken at the request of the publisher, yet he had for some time been accumulating materials with the object of writing a work which should be of use to the student and practical physician, and for which a need in his opinion existed. In this matter we are disposed to agree with Dr. Behrend, for neither the classic work of Hebra nor the more popular treatise of Neumann are calculated for every-day, practical use, and there has been sore need in Germany of treatises like that of Duhring in this country and Fox in England, which, while representing the actual state of dermatology, should be compendious and useful in every-day practice.

We rise from the perusal of Dr. Behrend's book with the conviction that he has succeeded in his object, and has produced a work both convenient in size and easy to handle, and containing a surprising quantity of information with regard to the various diseases of the skin and their management. In two respects Dr. Behrend is particularly fortunate. He manages to preserve for the most part a due proportion in the description of the various affections, giving to each the prominence due to its relative importance, and eliminating all extraneous matter, and he writes in a style unusually condensed for a German, and yet at the same time perfectly lucid and very interesting.

The earlier part of the book is taken up with a description of the anatomy and physiology of the skin, the primary and secondary lesions, diagnosis, etiology, therapeutics, and classification. Under the head of internal remedies the author speaks of arsenic, mercury, and iodine alone, regarding all other remedies of a general character as insignificant and not strictly directed against the skin affections for which they are usually given. He speaks with just scorn of the now, happily, extinct notion that it is dangerous to cure a skin disease too

quickly, a superstition which has too often been taken advantage of to hide the ignorance of the practitioner desirous of putting a good face upon a failure to cure severe cutaneous disorders.

Under the sub-head of external remedies, water, soap, sulphur, tar, caustics, and fats are considered; their general effect and the conditions to which they are applicable being in each case indicated.

With regard to classification our author follows Hebra pretty closely, and this we think leads him occasionally into positions which are almost absurd, as where Class II., being "anemias of the skin," his plan compels him to devote a separate section to this, although there are no anemias of the skin as distinct forms of disease.

We think he is mistaken, too, in devoting valuable space to the sub-class of "contagious exudations," which includes measles, scarlatina, variola, and varicella, subjects better and more thoroughly treated in works on general medicine. Again, Class IX., "ulcers," has, it seems to us, no adequate *raison d'être*. Ulcers are either the result of traumatism, when they come under the care of the surgeon, or they are the result of a process which is itself the essence of the disease, the ulcer being simply one of the symptoms or a step in the disease process.

Part II. is occupied with an account of the particular affections. Of these pictures of disease we may repeat what was said above, that they are in some degree models of terse and lucid description, almost all the essential points in the anatomy, etiology, diagnosis, prognosis and therapeutics being briefly stated.

Among the subjects especially worthy of mention is that of artificial eruptions, including medicinal rashes, which are very well described. The others, excepting the appendix on syphilis, which is trifling, are of even and high merit. We regret to observe that Dr. Behrend holds to the obsolete and perplexing custom of naming the various syphilitic eruptions after diseases which are called to mind by the appearance of the lesions, as *acne syphilitica*, *varicella syphilitica*, etc. This unscientific plan tends to produce confusion.

Dr. Behrend's devotion to his master, Hebra, leads him sometimes into what seems an undue exaltation of merely local measures of treatment, and we occasionally find that the internal remedies applicable to a disease are scarcely or not at all noticed. This is particularly observable under acne and eczema, where internal measures, which, in our experience, are frequently alone sufficient to cure, are scarcely alluded to. No wonder our author says of acne that it is hardly ever curable.

The author's ignorance of American literature has given occasion to numerous lacunæ in his descriptions of diseases which have been particularly investigated in this country, and the prominence of obscure German names with the almost total absence of quotations from distinguished American authors is one of the signs of that unfortunate parochialism which has injured the progress of medical science in France, and sometimes appears to threaten that of Germany.

One more criticism we must be permitted upon the extraordinary wood-cuts, which are the vilest imaginable, and have hardly a parallel outside of the quack pictures of skin diseases seen in our daily papers. It is a misfortune that so good a book should be so wretchedly illustrated.

A. V. H.

ART. XXXII.—*A Manual of Midwifery, for Midwives and Medical Students.* By FANCOURT BARNES, M.D. Aber., M.R.C.P. Lond., Physician to the General Lying-in Hospital, and to the British Lying-in Hospital, etc. etc. 12mo. pp. 201. Henry C. Lea, Philadelphia, 1879.

THIS is, as its name implies, "a manual," and small enough to be carried in the pocket of a midwife, to whom it more particularly belongs. The volume is illustrated with fifty wood-cuts, generally taken from the works of Drs. Playfair, Tyler Smith, and Robert Barnes; and these are much better than those usual in books of this class. We do not approve of the recently-adopted English custom of writing "after Playfair"—"after Barnes," etc., under the pictures taken from the works of other authors, unless it is certain that they were original with them. In this manual, such an apparent credit is given to recent authors for illustrations that have been handed down for thirty years or more. We recognize very familiar pictures, from the works of Ramsbotham and others, marked with the names of recent writers. Fig. 27 ("after Playfair") was used by the late Prof. Hodge in 1841, in the form of an oil painting, as an illustration for his lectures; and it was then a copy. The same may be said of Fig. 32. Fig. 3 is in Tucker's *Midwifery*, a compiled manual of 1848. There are original pictures in the works of Playfair, Robert Barnes, and Tyler Smith, which it might be well to credit to them if known to be such, but we do not see the necessity of a general credit, when such has already been given in the preface. Dr. Robert Barnes is very particular that his own designs shall have "R.B." after them, and was quite severe upon Playfair for leaving out the ("after Barnes") in the first edition of his *midwifery*; so we presume the son feels called upon to credit all around, whether there is a claim or not. It would puzzle one to find out who originated even half of the designs used in obstetrical books. We have seen pictures of instruments thought to be modern, that certainly existed before the year '70; and we know of others claimed as new, that have their likeness in very old books.

Dr. Barnes's manual having been prepared under the advice of experienced writers, contains many of the things most important to be known by midwives, and obstetrical students about to learn the management of labour cases practically. We confess, as we have before stated, that we are not much in favour of what are called manuals. Few men have the power of condensation to such a degree, as to enable them to produce a little book, with the contents of a large volume: subjects will be sacrificed to space, and matters of moment omitted. The work is well printed on tinted paper, and is a credit to the publisher and printer.

R. P. H.

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ART. XXXIII.—*American Health Primers.* 32mo. Philadelphia: Lindsay & Blakiston, 1879.

1. *Hearing, and How to Keep It.* By C. H. BURNETT, M.D. Pp. 152.
2. *Long Life, and How to Reach It.* By JOSEPH G. RICHARDSON, M.D., Professor of Hygiene in the University of Pennsylvania, etc. etc. Pp. 160.
3. *The Summer and Its Diseases.* By J. C. WILSON, M.D., etc. etc. Pp. 160.

THIS series of hygienic tracts, of which the three little volumes named are the earliest issues, bears a striking resemblance both in form and design to those just noticed.



Dr. Burnett's work upon the Hearing and How to Keep It, will not be, and probably was not designed to be, especially edifying to medical readers. Considered as written for the laity, it seems to convey sound professional knowledge in very simple and every-day words. There was undoubtedly room for a work of this kind. As a rule, people think or care very little about the sense of hearing until they begin to suffer from its decadence. Parents especially stand in need of an intelligent appreciation of the tendency to ear-troubles after certain diseases of children, and which may become manifest only after medical attendance has ceased. To watch for, guard against, and take prompt measures for removing such troubles, requires information not usually possessed except by readers of some tract like this before us. And the need is not much less in the case of adults. Few men detect, or pay much heed to, impairment of hearing in its early and curable stages. Indeed it is surprising to notice how frequently almost total loss of function in one ear may exist without detection.

Dr. Richardson's contribution to the series is certainly free from one or two traits possibly open to objection in one of the numbers of the English publication elsewhere noticed. If there the writer be in some places above the popular comprehension, here he may possibly be thought to somewhat unduly underrate the average reader's understanding.

The several chapters deal, in a very matter of fact way, with points connected with health and consequent longevity. If the people at large can be induced to read anything of this kind, we should think that this "American" series—so far as issued—stood at least as good a chance of securing profitable attention as its English competitors under a similar title. No one chapter seems to call for special mention. All are sensible and practical. The passages which point out the peculiar liability of the aged to certain diseases, such as head or heart affections, in connection with extreme cold weather, are well put, and should be useful in causing special care at such age and season.

The third number of this series has especial merit and value, as compared with the English series; for it deals with troubles common enough here, but almost unknown in the comparatively cool climate of the British isles. It could scarcely be expected that any English physician, lacking foreign experience, could write intelligently as to the diseases peculiar to the American hot season. Therefore, with all respect and appreciation for the English publication, we may claim superior merit as to this one subject, at least, for the "American" Primers.

While no young physician can afford to despise the instructions here given, the matter is, of course, principally designed for the typical, intelligent, common-sense citizen, who insists on thinking for himself, and "knowing the reason why." The characteristics of the American summer climate are fairly brought out. Its peculiar dangers are described, and its remedial measures suggested in a manner that any American layman will understand,—though possibly even a highly educated English physician might fail to appreciate the exact situations described. The conditions seem to be quite different in the two countries.

The author takes a common-sense view of "cholera infantum," and cognate maladies. The Rules for Management of Infants during Hot Weather, as distributed for several summers by the Philadelphia Board of Health, are here reproduced,—and of course endorsed. We can well conceive that,—attention once secured to them,—these rules may be extremely useful. Physicians, we think, should take more pains than they do to direct the attention of parents to such tracts as the one just named.

The chapter on fevers, malarial and continued, contain about all that the unprofessional reader could profitably peruse. Water, the air from marshes, and sewer-gas, are all noted as causing febrile diseases. The philosophy of the matter

is simply and well set forth, and precautions against contraction of intermittents, as well as the general palliative treatment of febrile symptoms, are sensibly described.

"Summer colds and hay asthma" are treated in one chapter. The writer thinks that a "cold" usually lasts longer in summer; and seems perhaps to intimate that the floating pollen of plants may protract a common "cold," as well as originate the specific maladies known as "hay-fever," "rose-cold," etc. He gives some countenance to the notion that common catarrh may be contagious.

In dealing with the specific catarrh just named, it seems to us that the author is not precisely accurate in saying that "our knowledge of the nature of the cause is very much more exact and definite than in most other diseases." The onset comes—in each case—at a painfully definite period, and the sequence of symptoms is disagreeably exact; but we scarcely perceive how the adjectives apply to our general knowledge of the causation of the malady. While naming the pollen of the grasses, and of Indian corn, as observed causes, Dr. Wilson seems to imply that numerous plants may exert the same unpleasant power. In naming places where habitual sufferers escape their expected affliction, he omits to mention Eastport, Maine, with its delicious summer coolness and delightful scenery.

The skin, with its summer affections, is well treated. Freckles, sunburn, prickly heat, chafing, etc., are sensibly described, and the principles of cure clearly set forth. Judicious measures are suggested for insect bites, and for poisoning by the "wild ivy."

The fact that Dr. W. W. Keen, of our city, is editor of the series, is ample warrant for the excellence of the numbers yet to come. B. L. R.

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ART. XXXIV.—*Pott's Disease, its Pathology and Mechanical Treatment, with Remarks on Rotary Lateral Curvature.* By NEWTON M. SHAFFER, M.D., Surgeon in Charge of the New York Orthopædic Dispensary, etc. 12mo. pp. 82. New York: G. P. Putnam's Sons, 1879.

THIS little volume with a long title has apparently been written for the purpose of opposing the use of the plaster jacket, which has come into general use with such astonishing rapidity. In these days the desire to hear or to tell some new thing is as active as at Athens in the days of Paul, hence the free discussion of any novel method of treatment is to be encouraged, that one may not be carried away by undue enthusiasm for that which is new. The author devotes the first chapter to the pathology, and the second, which is the final one, to the treatment of spinal caries. He also incorporates a few remarks on the pathology of rotary lateral curvature, which he states has a specific pathological cause and not merely a mechanical etiology; he claims to have demonstrated from a clinical standpoint that a simple non-specific loss of muscular equilibrium cannot explain the phenomena of a typical, rotary lateral curvature.

He lays a good deal of stress upon the occurrence of reflex muscular spasm as a symptom of spinal disease, and says it is a remarkable fact that a prolonged reflex spasm of certain muscles either of the spine or limbs may exist without any history of pain. The importance that this spasm acquires in diagnostic value must be evident, though it is to be remembered that it relaxes under the use of anæsthetics, and then as a symptom of disease fails.

In considering the treatment of spinal caries he says he differs from those who believe that Pott's disease is traumatic in its origin, and hence quite easily cured.

Mechanical treatment should not be used with an idea of overcoming the muscular resistance, for it cannot be entirely annulled by any mechanical device; and, moreover, he has in some cases seen suspension aggravate the lesion, increase the subsequent muscular resistance, and intensify the pain. He holds that the change produced by suspension is apparent rather than real, and that the increase in height noticed is due to the extensibility of the unaffected structures and the modification of the compensatory curves. Recumbency in the prone position for a few moments will produce all the "separation" required to cause a diminution of the injurious pressure or contact of the vertebral bodies.

The gist of the book may be gathered from a recapitulation of the advantages claimed for the antero-posterior support, and a statement of the objections to the plaster jacket. The antero-posterior support, as he uses it, he says, acts scientifically upon the principle of the lever with the fulcrum at the point of disease, it is easy of adjustment, comfortable to the patient, can be readily removed at any time by placing the patient in the prone condition, does not interfere with respiration or transpiration, and finally is clean and light. The plaster jacket on the other hand is believed to be objectionable because it is heavy and dirty, it covers a great area of skin, is apt to cause excoriations that may not be discovered, it requires the patient to be suspended at every change or removal of the dressing, and fails in the majority of cases to accomplish the objects for which it is applied. He states, moreover, that it can only be of advantage in cases of disease below the seventh dorsal vertebra.

The relation of some illustrative cases and the exhibition of some wood-cuts, showing the apparatus recommended, completes the volume. Though the plaster jacket has undoubtedly been received with too extravagant praise, it possesses more merit than would seem apparent from a perusal of the book before us; and, if the porous felt and other forms of laced cuirass be considered, it must be admitted that many of the disadvantages of the plaster dressing are removed without impairing its efficiency in properly selected cases. The book is of value because of its containing a good many practical suggestions, but it presents a somewhat one-sided view of the question.

J. B. R.

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ART. XXXV.—*Clinical Lectures on Diseases Peculiar to Women.* By LOMBE ATHILL, M.D., Univ. Dub., Master of the Rotunda Hospital, Dublin; Consulting Obstetric Surgeon of Adelaide Hospital, etc. Fifth edition, revised and enlarged. 12mo. pp. 342. Philadelphia: Lindsay & Blakiston, 1879.

Few books of its size have been so generally and highly commended by critical reviewers as this little work of Dr. Athill's, now in its fifth edition. In the ordinary sense it is not a manual, as its size would indicate; but it is the concentrated essence of the knowledge of one who has become wise by reason of long and well-digested experience in the subjects treated; having had opportunities such as fall to the lot of but a small proportion of the workers in our profession. We are not partial to the class of books ordinarily denominated *manuals*, which are apt to be little in more senses than one; being too often compilations of an inferior grade. Neither are we given to praise large and comprehensive works, because they are such; when all that is valuable and practical might have been condensed in half the space. Dr. Athill has reduced his work by making it simple and practical, avoiding historical and speculative matters, and confining his remarks to the more common maladies of women; illustrating them by refer-

ence to cases in his own hospital and private practice; and giving to the reader the methods of treatment that have been found most effectual in ameliorating the condition or curing the case.

The American edition is neatly printed, and illustrated, making a creditable volume. We can very cordially recommend the work to American practitioners, whether beginners in the profession or advanced in the study of medicine.

R. P. H.

ART. XXXVI.—*On Diseases of the Stomach, the Varieties of Dyspepsia, their Diagnosis and Treatment.* By S. O. HABERSHON, M.D. Lond., Senior Physician to, and late Lecturer on the Principles and Practice of Medicine at Guy's Hospital, etc. Third edition. 12mo. pp. 324. Philadelphia: Lindsay & Blakiston, 1879.

THIS volume is chiefly a running commentary on the varieties of dyspepsia, unencumbered by scientific and pathological facts, such as impress their characteristic value on the author's estimable work on Diseases of the Abdomen, noticed in the last issue of this Journal. It is written in diffuse language and is cut up into twenty distinct chapters. Sufficiently free from technical terms to be comprehended by the intelligent invalid, there is much collateral disquisition on topics well understood by the average medical reader, and of questionable necessity in a monograph strictly intended for professional perusal.

Not less than ten chapters are employed to describe as many varieties of dyspepsia. These are preceded by six chapters on general subjects relating to diseases of the stomach and their treatment, and are followed by four on degeneration, ulceration, cancerous disease, and spasm of the stomach, respectively.

Exception might well be taken to loose construction of sentences, numbers of which are so indistinct here and there, as to be incomprehensible or misleading. Thus, the term dysphagia indicates difficulty in swallowing, even when the action of the œsophagus is not impaired; the endermic or hypodermic method of medication does not, consists in local injections into the skin; the hypodermic use of medicines "for the production of general symptoms," is vague; no indication is given of manner or method by which "in some cases an electro-galvanic current will act as an effectual stimulant to the enfeebled muscles" when the healthy tone of the abdominal tract has been impaired by too free use of purgatives; and so on. These unsatisfactory expressions would not elicit special comment were it not that the author's position is such that his readers have a right to expect circumspection in whatever he prepares for their study.

As an expression of the results of long personal experience in both hospital and private practice, conveyed in agreeable, though not always perspicuous diction, this contribution of Dr. Habershon has a special value of its own, and in so far is entitled to the favourable consideration of the practitioner, as is already testified by a demand for a third edition.

J. S. C.

ART. XXXVII.—*The Student's Guide to the Diseases of Women.* By ALFRED LEWIS GALABIN, M. A., M. D., F. R. C. P., Assistant Obstetric Physician and Joint Lecturer on Obstetric Medicine to Guy's Hospital, etc. 12mo., pp. 370. Philadelphia: Lindsay & Blakiston, 1879.

DR. GALABIN is the Hon. Librarian of the London Obstetrical Society, and well known as an active gynæcological worker in the same organization. The little book before us is a neat specimen of book-making, and although professedly intended for the undergraduate in medicine, is well adapted to instruct the general practitioner in those diseases of women which he is most frequently consulted about. The size of the volume is not due to a superficial treatment of a large number of subjects, but to the exclusion of those which usually make the great bulk of large treatises on gynæcology, such as the requirements of the specialist demand. For the general practitioner, in regions where there are no specialists, and in cities, where all should be informed upon the ordinary maladies, this will be found a valuable practical work.

Those who desire to study the various ingenious operations for the cure of perineal rupture; and the fistulæ between the bladder and uterus; vagina and bladder; and rectum and vagina, must look elsewhere for them, as Dr. Galabin has confined his work to the following subjects, viz.: External and internal explorations for diagnostic purposes; Physiology of menstruation; Malformations of uterus and vagina; Displacements of pelvic viscera; Hyperplasia, Atrophy, Hyperæmia, and Inflammation of the uterus; Uterine growths; Diseases of ovaries, Fallopian tubes, uterine ligaments, and adjacent peritoneum, and cellular tissue; Diseases of the vagina and vulva; and Functional and Symptomatic disorders.

These subjects have been well treated, by one who draws from his own experience, and appears to be blessed with the capacity to express his ideas clearly, without verbal superfluity. The book might readily have been made much larger, without expressing any additional ideas, or adding a particle to its practical value. It is not a perfect treatise, but is of much value in teaching the management of the common maladies of women.

R. P. H.

ART. XXXVIII.—*Étiologie et Pronostic de la Glycosurie et du Diabète*, par le Dr. JULES CYR. 8vo. pp. 172. V. Ad. Delahaye et Cie. Paris, 1879.

IN estimating the value of the various conditions which have been urged as predisposing and exciting causes of diabetes, and the etiology being determined, in forming a prognosis in any given case, Dr. Cyr lays great stress on the importance of distinguishing between *glycosuria*, by which he indicates simply the emission of saccharine urine, without regard to its quantity, concomitant symptoms, etc., and *diabetes mellitus* with its well-known train of phenomena. The former, he considers, may be regarded as a simple exaggeration of a normal function, as instanced in the transitory condition produced by "sugar-puncture," while the latter is a glycosuria plus additional phenomena. His studies are undertaken with a view of determining the etiological conditions which distinguish these forms, or which may cause the passage of one into the other. His essay is a methodical analysis of the various statistics and theories which have been published on this subject, while he has himself brought forward no new facts, and his conclusions do not differ from the opinions generally entertained.

R. M. S.

# QUARTERLY SUMMARY

OF THE

## IMPROVEMENTS AND DISCOVERIES

IN THE

## MEDICAL SCIENCES.

### ANATOMY AND PHYSIOLOGY.

#### *Inequality in Length of Lower Limbs.*

Dr. J. G. GARSON, Anatomical Assistant at the Royal College of Surgeons, England (*Journ. of Anat. and Phys.*, July, 1879), has measured with great care the lower limbs of 70 skeletons of various ages, from 12 years and upwards, of various sexes, and of various races, and has confirmed the observations of Drs. Cox, Wm. Hunt, and J. B. Roberts, of Philadelphia, as to their inequality in length. Dr. Garson took great pains to ascertain that the bones of each skeleton measured belonged to the same body and rejected all those that were doubtful. In 10 per cent. only did he find the right and left limbs of equal length, and of these there are only two cases in which the femur and tibia of one side corresponded respectively to the femur and tibia of the other. In the remaining five cases, it was by compensation that the limbs were equal; *i. e.*, the tibia being shorter where the femur is longer, or *vice versa*. Dr. Garson found a greater tendency to variation in the femur than in the tibia.

In 25 instances, or in 35.8 per cent., the right limb was longer than the left, the average preponderance of the former over the latter in these cases being 3.3 mm. In 38 instances, or in 54.3 per cent., the left was longer than the right, and its average preponderance over the right is 4.8 mm. The left limb, therefore, was not only more frequently longer than the right, but the difference between the limbs was greater, on an average, when it was the longer than when the right was the longer, the greatest preponderance of the right limb being 8 mm., whereas that of the left was 13 mm. Over the whole 70 cases, the left limb was  $1\frac{1}{2}$  mm. longer than the right.

The inequalities in the length of the limbs do not, as far as Dr. Garson's observations go, seem to be confined to any particular age, sex, or race.

#### *The Duplication of the Functions of the Brain.*

M. LUYX has presented to the Académie de Médecine an important and voluminous memoir on this subject, of which the following are the conclusions. 1. In the normal condition of the functions of the brain, its hemispheres are endowed with a certain autonomy. 2. The left hemisphere, which is quicker in its development, is also that which presents the greatest mass. In general it surpasses its fellow in weight by from five to seven grammes (78 to 108 grains). 3. While

the cerebral lobes, from the point of view of certain combined psychical operations, act synergically, there are, on the other hand, a certain number of circumstances in which this united action ceases to occur. Thus in the action of articulating sounds and of tracing written characters with the right hand, in oral language or in written language, it is only the left hemisphere which enters into action. 4. In the act of playing musical instruments, and the piano in particular, cultivation creates artificial conditions of cerebral activity, in virtue of which each lobe acts singly independently of its fellow, not only as regards psychomotor phenomena but also in regard to mental operations for the purpose of reading and music, accomplishing operations of judgment, and controlling co-ordinated motor acts. 5. In the domain of mental pathology, the aptitudes natural to the autonomic activity of each cerebral lobe are susceptible of being revealed with remarkable energy. In the insane, the difference in the weight between the mass of the cerebral lobes is much greater than it is normally. The disturbance of equilibrium between each of them is much more strongly marked. It is the right lobe which in these cases appropriates to itself the nutritive activity. The difference, instead of being seven *grammes*, rises sometimes to twenty-five and thirty *grammes* without any destructive lesion. In certain cases of insanity, those suffering from hallucinations with lucidity, or in lucid hypochondriacs, the coexistence of lucidity and of delusion may find a rational explanation in the integrity of one cerebral lobe and the morbid overgrowth of certain regions of the opposite one. In a certain number of such cases, M. Luys has ascertained that the morbid process was unilateral and manifested by an unusual projection of the paracentral lobe. These facts seem to demonstrate the possibility of the coexistence of hallucination and lucidity. 6. Besides the cases thus signalized, there are a great number of psychopathic states, impulses, alienations with consciousness, in which the disorder can have no other rational and truly physiological explanation than a temporary want of harmony between the two cerebral lobes, one of which performs its functions irregularly, whilst its fellow is in a normal condition. 7. With regard to the prognosis of mental diseases, the survival of lucidity and its persistence being well ascertained, there may be deduced from it conclusions of a certain importance, for this symptom would imply the persistent integrity of one lobe only with all its dynamic aptitudes; and reciprocally the absence of lucidity, ascertained in a precise manner, would imply the simultaneous and parallel invasion of the two cerebral lobes. In fact, it is known that the majority of persons suffering from hallucination, who at the outset are lucid during a certain time, at last cease to be so; and at the end of several years, by the natural evolution of the morbid process, they end by being completely insusceptible to excitation from without and more or less deprived of the comprehension of all that passes around them. In cases of this kind, the lesions affect equally the two hemispheres, and dementia reveals itself with its character of absolute incurability. 8. The theory, in a word, of the duplication of cerebral activity may give a rational explanation of certain morbid phenomena of mental disorders, which up to the present time have remained in the dark for want of sufficient data calculated to make them prominent.—*British Med. Journal*, June 7, 1879.

## MATERIA MEDICA AND THERAPEUTICS.

### *Menthol; a New Antiseptic.*

Menthol, or peppermint camphor, is a crystallizable body deposited from Chinese oil of peppermint on exposure to cold. It is met with in the form of small colour-

less fragrant prismatic crystals, not unlike sulphate of magnesia. In fact, when first imported from Japan, some twenty years ago, it was for a time suspected to be nothing but Epsom salts flavoured with peppermint. It is now known to have a definite chemical composition, and to be the camphor, or stearoptene of peppermint oil. It is but slightly soluble in water, although it imparts to it its characteristic smell and taste. It dissolves readily in alcohol and ether, and in oils, both fixed and volatile. It melts at about the temperature of the body, and when further heated volatilizes without decomposition. From a series of experiments recently undertaken by Mr. Archibald Duncan, a student of the University of Edinburgh, it would appear that it is possessed of antiseptic properties similar to those of its homologue, thymol. At present it can hardly be regarded as a commercial article; but it could be readily imported from Japan, and there is no reason to suppose that its price would be prohibitive. An impure sample sent over from Canton, in 1872, was valued at 30s. a pound. We are not aware that it has been used in therapeutics; but strong oil of peppermint painted over the part has long been a favourite mode of treatment in China for gout and neuralgia, and it might prove useful in these complaints. The Japanese "Po-ho-yo," or neuralgia remedy, probably contains menthol:—*Lancet*, June 7, 1879.

#### *Pelletiérine as an Anthelmintic.*

This substance, the active principle of the pomegranate root bark, has lately been somewhat extensively employed on the Continent as a remedy for tapeworm (*taenia inermis* or *medio-canellata*). It is used in two forms, as sulphate and as tannate. To determine which of these is the more active, M. BERENGER-FÉRAUD made a long series of trials of each; he now embodies the results of his investigations in the following propositions:—

1. The tannate was successful (killed the worm and brought it away *entire*) in 12 out of 14 cases; in the two remaining cases a certain measure of success was obtained, only the heads of the worms could not be found.

2. The sulphate produced the desired effect only 7 times in 20 cases.

3. The tannate seems preferable to the sulphate, therefore, not only for the reasons just given, but also because it is less apt to cause nausea and vomiting, and because, to a higher degree than the sulphate, it favours the action of the purgative by which it is followed.

4. The dose of the tannate of pelletiérine should vary from 40–50 centigrammes (6–7½ grains).

5. It should be taken in one dose, early in the morning, the last meal of the previous day having consisted of milk and bread.

6. It should be followed in a quarter of an hour by a purgative of tincture of jalap, castor oil, or sulphate of soda, as seems best in the particular case. Dr. B. is of opinion that a motion of the bowels should be obtained as soon as possible after the remedies have been given, and he advises the adoption of measures which will tend to produce this effect, as it has seemed to him that the chances of the head of the worm being expelled are the greater the more rapid and complete the purgative action.—*Glasgow Med. Journal*, August, 1879, from *Bull. Générale de Thérap.*, July 15, 1879.

#### *On the effects of Chloroform, Ethidene, and Ether, on Blood-pressure.*

The Committee of the British Medical Association on the Action of Anæsthetics report (*British Medical Journal*, June 21, 1879) that the facts obtained from their researches seem to warrant the following:—

1. Both chloroform and ethidene administered to animals have a decided effect in reducing the blood-pressure, while ether has no appreciable effect of this kind.



2. Chloroform reduces the pressure much more rapidly and to a greater extent than ethidene.

3. Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action, the pressure being reduced with great rapidity almost to *nil*, while the pulsations are greatly retarded or even stopped. The occurrence of these sudden and unlooked for effects on the heart's action seems to be a source of serious danger, all the more that in two instances they occurred more than a minute after chloroform had ceased to be administered and after the recovery of the blood-pressure.

4. Ethidene reduces the blood-pressure by regular gradations, and not, so far as observed, by sudden and unexpected depressions.

5. Chloroform may cause death in dogs by primarily paralyzing either the heart or the respiration. The variations in this respect seem to depend to some extent on individual peculiarities of the animals; in some, the cardiac centres are more readily affected, in others, the respiratory. But peculiarities in the condition of the same animal very probably have some effect in determining the vulnerability of these two centres respectively, and they may both fail simultaneously.

6. In most cases, respiration stops before the heart's action; but there was one instance in which respiration continued when the heart had stopped, and only failed a considerable number of seconds after the heart had resumed.

7. The use of artificial respiration was very effective in restoring animals in danger of dying from the influence of chloroform. In one instance, its prolonged use produced recovery, even when the heart had ceased beating for a considerable time.

8. Under the use of ethidene there was on no single occasion an absolute cessation either of the heart's action or of respiration, although they were sometimes very much reduced. It can, therefore, be said that, though not free from danger on the side of the heart and respiration, this agent is in a very high degree safer than chloroform.

9. These results confirm and amplify those stated in a previous report, to the effect that ethidene does not compromise the heart as does chloroform. By the method of experimentation then employed, the effect on the blood-pressure could not be determined; and altogether the results here obtained are more exact and unequivocal.

It may be added that since the last report ethidene has been given to a number of patients of all ages, with results which may be described as satisfactory. Given freely at first, it produced anaesthesia as rapidly as chloroform, and the effect could readily be kept up by comparatively small subsequent doses. The only drawback is that in some cases it produced vomiting; but it has not been determined that it does so more frequently than chloroform, over which it has the further advantage of producing less excitement and being more agreeable to the patients.

Isobutyl chloride was given to three patients, but it produced considerable excitement and proved an imperfect anaesthetic.

In concluding this report, the Committee would express the belief that, so far as purely physiological tests go, ethidene has proved itself as efficient an anaesthetic as chloroform, and a much safer one. It is not asserted that this agent ought at once to replace chloroform in practice; but it is believed that a very strong case has been made out for an extensive trial of it. It is impossible for the Committee, having numerous other engagements, to give the agent that extended trial in actual practice which is desirable; and they would ask those who are engaged in practice to use it in their cases, and to report the results they may have obtained.

*Nitrite of Amyl.*

The exact amount of vascular dilatation produced in frogs by the inhalation of nitrite of amyl has been carefully investigated at Heidelberg by Dr. GASPEY, who has detailed the observations in Virchow's *Archiv*. On the uninjured tongue of the frog the dilatation occurred immediately in both arteries and veins, and increased during the first two minutes. The duration of the dilatation depended upon the duration of the inhalation; if the latter was continued for two minutes, the dilatation lasted from ten to fifteen minutes. The amount of dilatation was at least one-third of the original diameter of the vessel. The rapidity of the blood-current remained about the same; in the first movement after dilatation it appeared somewhat quickened, but always quickly returned to the normal. In order to ascertain whether the nitrite of amyl acts upon vessels which are already dilated by some other means, irrigation of the frog's tongue with a solution of salt was employed, which is known to cause dilatation of the vessels and retardation of the blood-current. Amyl nitrite was found to still produce its effect, although in less degree—amounting to about one-fifth of the original size of the vessel. Experiments on the effect of the amyl in distant parts showed that the changes in the web of the frog's foot differed somewhat from those observed in the tongue. The dilatation occurred in about the same time, but was slighter. There was an immediate but very transient increase in the rapidity of the blood-current, followed by a distinct retardation.

Another point investigated was the effect of the amyl on tissues in which inflammation is going on. Its action on an inflamed tongue was found to be essentially the same as on the uninjured tongue, thus confirming an interesting observation of Mr. Talfourd Jones that hemorrhage after injury may be increased by the amyl. Other observations on the frog's mesentery showed that the process of inflammation was not in the least interfered with by the inhalation. The migration of the white corpuscles was not lessened. It is known, however, by the experiments of Thorma and Appen, that as a rule, whatever accelerates the blood-current lessens migration, and whatever retards the blood-current favours migration. It seems, therefore, that the influence of amyl nitrite on the inflammatory process may be different according to the position of the part, since retardation of the current was observed in the frog's foot and was not observed in the tongue.—*Lancet*, Aug. 9, 1879.

*Quebracho, a Palliative Remedy in Dyspnœa.*

Dr. F. PENZOLDT, of Erlangen (*Berl. Klin. Wochenschrift*, No. 19, 1879), narrates some experiments both on man and animals with a new drug, the bark of *Aspidosperma quebracho* (*Apocynaceæ*), sent from Brazil, where it is reputed to have antipyretic properties. The form of preparation used throughout was a watery solution of an alcoholic extract of the bark, ten parts of the latter being percolated with one hundred of alcohol for several days, and the liquid filtered, evaporated, dissolved in water, again evaporated to dryness, and the residue dissolved in twenty parts water.

The main results obtained in frogs were complete motor paralysis of central origin, respiratory paralysis, and diminished frequency of the pulse, independent of irritation of the vagus. In rabbits and dogs, motor paralysis and dyspnœa, increasing with the dose administered, were noticed. The dyspnœa in the rabbit, however, appeared to depend on retardation and deepening of the inspirations; while in the dog the inspirations were accelerated. In the latter, also, there was salivation.

Experiments on animals with artificial fever, produced by injecting putrid fluids, showed no decided reduction of the temperature, and hence quebracho is probably not, as was supposed, an antipyretic. It should be added that it is not an antiseptic, but only temporarily retards putrefaction. The results obtained in actual cases of fever in men were also negative, but Dr. Penzoldt thinks that, considering the close chemical relationship between the alkaloid, "aspidodermin" which Baeyer has extracted from quebracho-bark and quinine, the subject requires further working out in this direction.

By the accidental observation of a patient with pleurisy and emphysema, on whom the antifebrile effect of quebracho was being tried, Dr. Penzoldt was led to try the bark in various forms of dyspnoea, depending on emphysema, bronchitis, phthisis, pleurisy, etc., and obtained remarkably good results. A teaspoonful of the above-mentioned solution was given two or three times a day. The most marked objective phenomenon after its exhibition was a reddening of the previously cyanosed or livid tint of the lips and face. In a case of emphysema where the patient was blessed with a nose the seat of aene hypertrophica, the ordinary violet-blue colour of the organ became fiery red, and excited the surprise of the other patients in the ward. The respirations generally became deeper and less frequent, and the patients expressed themselves subjectively much relieved. The first feeling after taking the drug was one of warmth in the head; many said that they had less desire to cough, and that they found expectoration easier. Occasionally sweating occurred, and in some cases abundant salivation. No bad effects were noticed with the dose mentioned.

Dr. Penzoldt finds that the addition of quebracho solution to blood, in the presence of oxygen, makes it assume a bright red colour, and he is inclined to think that possibly the blood is rendered capable of taking up more oxygen than usual, and carrying it to the tissues. This is, however, merely a provisional hypothesis, and at present there is no satisfactory explanation of the fact that, while moderate doses of the extract alleviate dyspnoea in man, large doses cause dyspnoea in the lower animals.

As yet, quebracho bark is not a commercial product, but the *wood* is imported in large quantities for tanning purposes. The action of an extract of the wood is similar to that of the bark, but weaker. The alkaloid aspidodermin affects the frog, on the whole, just as the extract of the bark does.—*Med. Times and Gazette*, July 12, 1879.

#### *Inhalation of Eucalyptus Oil.*

Dr. MOSLER, of Griefswald (*Berliner Klin. Wochenschrift*, No. 21) strongly recommends oil of the leaves of eucalyptus, administered by inhalation, as a remedy for pharyngeal diphtheria. The strongest dose which he has given was according to the following formula: oil of eucalyptus leaves, 5 grammes; rectified spirit, 75 grammes; distilled water, 170 grammes; to be shaken together and used for ten inhalations. In this dose the medicine was inhaled four times daily, for ten or fifteen minutes each time, by a patient suffering from bronchitis and chronic laryngitis; it produced no troublesome effect, but acted as a powerful expectorant. Another formula employed by him was: oil of eucalyptus leaves, 2 grammes; rectified spirit, 20 grammes; distilled water, 180 grammes; for ten inhalations. This was given with the best effect in a case of croupous pneumonia in the stage of deservescence, with residual infiltration of the right upper and middle lobes. It was inhaled four times, without any bad effect. A still weaker preparation (1.5 of eucalyptus oil, 15 of spirit of wine, and 200 of water) has been used by him in several cases of nasal and pharyngeal catarrh, and also in a case of acute pharyngitis accompanied by slight laryngitis, with good effect. Dr.

Mosler is engaged in further researches on the action of inhalation of eucalyptus oil in affections of the respiratory organs.—*British Medical Journal*, June 21, 1879.

*Mode of Action of Iron in Chloro-Anæmia.*

Dr. HAYEM, in a communication to the Société de Biologie (*Rév. Méd.*, June 14), stated the results of the examinations made on a great number of patients in his service at the St. Antoine, in order to ascertain the modifications which the blood undergoes under the influence of the treatment by ferruginous substances. He chose chloro-anæmia as a type of chronic anæmia, this being of such frequent occurrence among the Paris workwomen that it is constantly under treatment in the hospitals. The first effect of the administration of reduced iron, or of an assimilable salt of iron, to a chloro-anæmic woman is to cause the disappearance of the alterations in the globules which constitute the anatomical lesion in anæmia. This action is always sensibly manifested, whatever may be the number of globules. In some cases of slight anæmia the number of globules is not diminished, they simply undergoing change in form; but in other more serious cases both diminution in number and alteration in form take place. In these the iron acts first by restoring the existing globules to their physiological condition, and then by facilitating the genesis of other globules. Some physiologists have maintained that the iron does not become fixed in the blood, its passage through the economy sufficing for the good effects which result from its employment. In order to appreciate the value of this opinion, Dr. Hayem, in conjunction with Prof. Regnault, undertook some experiments on the mode of action of the ferro-cyanide of potassium, which is eliminated unchanged. Several anæmic patients were submitted to its treatment for some weeks, and an amelioration was obtained from its use, as sensible as if an assimilable salt of iron had been administered. But no sooner was it discontinued than the symptoms of anæmia returned with great rapidity; and, in order that the cure should remain definite, it was necessary that the ordinary ferruginous preparations should be given after the ferro-cyanide. Everybody knows how difficult it is sometimes to get some much enfeebled chlorotic patients to take reparatory aliments, so great is their disgust for all azotized aliment, vomiting often ensuing when they attempt to eat meat. Some women live upon a little bread and salad, and the quantity of urea they eliminate is then very small—sometimes as little as from four to six grammes in the twenty-four hours. In such women treatment becomes very difficult, it being nearly impossible to reproduce appetite in them. In these cases Dr. Hayem employs a means which has furnished most excellent results, and which consists in the daily inhalation of oxygen. The appetite soon returns, the vomiting disappearing at the same time; and so well do the patients then support azotized aliments, that the four regular “portions” of the hospital diet-scale becomes insufficient. When the urine is examined, the proportion of urea is found to have considerably increased; so that after continuing the inhalations for six weeks, the amount excreted may reach as high as thirty grammes in the twenty-four hours. The number of globules is at the same time increased, but they remain altered in form, showing that the disease is not cured. And, in fact, if after two months’ residence in the hospital such patients are allowed to go out without anything more having been done for them, at the end of a week they fall into as complete a state of anæmia as if they had never undergone any treatment. But if, after the oxygen inhalations, a ferruginous treatment be put into force, the cure remains real and definite. It results, therefore, from Dr. Hayem’s experiments, that in order to put patients into a state for the production of physiological globules, iron must be given them.—*Med. Times and Gazette*, July 5, 1879.

## MEDICINE.

*Treatment of Acute Rheumatism by Salicin and Salicylic Acid.*

In an interesting paper on this subject (*Lancet*, June 21, 1879) Dr. T. J. MACLAGAN maintains that salicin and salicylic acid are not anti-pyretic to any useful extent. He holds that they are anti-rheumatic, and their beneficial action in acute rheumatism is due, not to their allaying the fever, but to their putting a stop to the whole process of the disease, and to all that constitutes it—the fever as well as the other symptoms. As a rule, relief of pain precedes fall of temperature.

In the last three years Dr. MacLagan has used the two remedies in about equal proportions. The result has been to convince him that salicin is the better remedy of the two. His preference is based on the fact that he found the action of salicin to be tonic, while that of salicylic acid is depressing, sometimes alarmingly so. This difference, be it noted (and the point is an important one), is quite compatible with their exercising an identical action on the rheumatic poison, and evidence all tends to show that their action in this respect is the same. To get the full beneficial effects of either remedy it is necessary to give it in large and frequently repeated doses—twenty to thirty grains, at first every hour, and then every two, three, or four hours, as the symptoms decline. Salicylic acid and salicylate of soda cannot be given in such doses without some risk. Salicin may thus be given without fear.

To get the full beneficial effects of either salicin or salicylic acid in acute rheumatism, large doses are necessary. By smaller doses, he says, ten or fifteen grains every hour or every two hours—an attack of acute rheumatism may be arrested in two or three days. But let the remedy be given in the larger dose, and the process of the disease may be arrested in half the time. In a malady which tends to involve the heart and entail on the patient the terrible results of an endocarditis, every hour is of consequence. Cut the malady short in one day, and you may ward off cardiac complications which may appear if it lasts for two or three. It takes about an ounce of salicin or of salicylic acid to cure a case of acute rheumatism. The sooner this quantity is got into, or rather is passed through, the system the better. Dr. M.'s practice now is to give thirty grains every hour. By the time that an ounce has been thus taken—that is, in sixteen hours—the patient is generally free from pain, and the temperature at or near the normal. He then gives thirty grains every two or three hours till another ounce is consumed. After that thirty grains are given three times a day for a week or ten days, to guard against the possibility of relapse. Not unfrequently the patient feels better after three or four powders have been taken, and is practically out of the attack before the ounce is consumed. In such cases the interval between the doses may be widened after six or eight have been taken. Such is the course of events in favourable cases, and almost invariably their course in young subjects who have not previously suffered, or have done so only once or twice. In older subjects, who have had frequent and long-continued attacks, the acute symptoms may be as speedily allayed, but convalescence is more tardy and more apt to be interrupted. Cases treated by salicin seem to convalesce and pick up more quickly than those treated by salicylic acid or salicylate of soda.

Dr. MacLagan finds that salicin is also of value in the treatment of chronic rheumatism and neuralgia.

*The Influence of Treatment on the Course of Rheumatic Fever before and since the employment of Salicylic Acid.*

Dr. WILLIAM SQUIRE read a paper on this subject at a late meeting of the British Medical Association (*British Medical Journal*, Aug. 23, 1879). He said: A concurrence of three conditions is found in all cases of acute rheumatism: 1. Increased waste; 2. Checked elimination; 3. Ready febrile reaction. Of these, the last is the most important; even a certain specificity in this reaction is requisite to determine that the resulting disease shall be rheumatic fever and not tuberculosis, erysipelas, or pneumonia. To these three conditions treatment has always been directed. Complete rest is the first necessity. Rest diminishes waste, prevents pain, induces sleep, and so directly tends to lower fever; the balance of elimination, aided by diluents, is restored; and the patient placed in a fair way of recovery. It has been said that, where early treatment with every comfort can be secured, much of the danger of heart-mischief is avoided; but the tendency to heart-complication during attacks at the same ages is much the same for rich and for poor; what care and comfort can do, is to guard against the incidence of attacks during early childhood, when danger to the heart is most to be dreaded. No method of treatment has any specific power in preventing disturbance of the heart during the illness, or in precluding the relapses in which such disturbance may again arise. Whatever lowers the fever and shortens its duration, tends to avert heart-disease. While Dr. Squire was studying the progress of acute rheumatism in the clinique of La Charité in Paris, some cases were being treated with full doses of quinine, and others with repeated small bleedings. In these, relief was felt after the abstraction of a *demi-palette*, and, among other signs, the moist skin seemed to show in these patients that the fever was reduced; in those under quinine, from the headache and dry skin, the fever was said to remain unabated. The clinical thermometer completely reversed this impression: it showed the fever to be uninfluenced by the bleeding, and that a considerable reduction of temperature had been effected by the quinine. In many of these latter cases, convalescence was early; it was tedious and interrupted in the others. Quinine, in checking waste, unexpectedly lowered fever. Bleeding, expected to reduce fever by increasing elimination, failed in this object; as all evacuants fail—whether purgation, diuresis, or diaphoresis—when carried beyond the restoration or re-establishment of normal secretions to the elimination of morbid products or a supposed morbid poison. Another object aimed at by this treatment was, to counteract one of the primary products of the disease—an increase of fibrin in the blood, to which some of the evil consequences may be attributable. No doubt, potash and the nitrate of potash may be directed to this end with greater safety than bleeding or calomel can be; but the alkaline treatment, as well as the bleeding, tends to increase the subsequent anæmia which so much retards convalescence. Moreover, the increase of fibrin, the state of hyperinosis, is a direct consequence of the febrile state. This is diminished by whatever controls fever, while it is actually increased by some of the eliminative means employed, as by sweating under blankets; it is relieved by tepid sponging. All soothing means are antipyretic—ease of joints, sleep at night—whatever relieves pain reduces fever. Colchicum relieves the local pain of gout, and the fever falls. The general anæsthesia induced by salicylate of soda has much to do with the antipyretic influence it exerts in rheumatic fever. This sedative effect, with lowered vaso-motor reaction, permits a readier return to the normal excretion of urea, thus promoting and hastening the natural crisis, or rather lysis, in which the disease should end. With the increase in the amount of urea and uric acid excreted, the joints become less painful, and this in many

cases somewhat precedes the fall in temperature; hence the fever has been regarded as dependent on the articular mischief, and treatment by blisters has been directed specially to the affected joints, not without some degree of success. As much may be said for the eliminative treatment intended to promote the removal of the products of tissue-waste; neither plan will lower the first fever or lessen the danger of heart-disease, nor diminish the anæmia of convalescence with its tendency to relapse. Before the use of salicylic acid, we had no means of controlling the fever of rheumatism on which these evils depend. The power of quinine had found a limit; purgatives and salines proved useless. Aconite, digitalis, and veratrum had failed. Cold was reduced by Wilson Fox to its true service against hyperpyrexia, and bleeding proved to be as injurious in this complication as it is in the ordinary course of the disease. The iron-treatment introduced by Dr. Russell Reynolds checked in some degree the febrile reaction, prevented subsequent impoverishment of the blood, and some of the worst consequences of endocardial exudation. Its use in erysipelas, and in rheumatism following some specific fevers and the puerperal state, is well attested. With children, cases may arise where a choice has to be made between iron and salicylic acid; one or the other must be adopted; they cannot both be employed at once. Dr. Squire's experience of iron was a favourable one. Twice in children where the first signs of rheumatism were in the heart, this means, with chloral at night, gave good results. In one case of a boy five years old, treated early with salicylate of soda, no heart-affection occurred. In a girl three years old with an endocardial murmur, and no joint affected when first seen, good progress followed the salicylate, but a soft systolic or presystolic *bruit* remained. The only evidence of the earliest attack of acute rheumatism in young children is often in the heart. Second attacks of acute rheumatism in adolescents have been treated very advantageously by either means. The change from profuse perspiration and great restlessness to comparative comfort by the use of dialyzed iron in a young man with high fever, on the fourth day of other treatment, was very marked; good convalescence began in a fortnight. In a similar case treated on the third day with salicylate of soda, in twenty-four hours, before two drachms had been taken, all fever was subdued, and the convalescence began in a week. In second attacks, much prolonged, occurring to men at the age of fifty, one had pneumonia, one a systolic and cardiac murmur and diffused pulmonary *râles*; rapid improvement followed the use of salicylate of soda. Cardiac irritation is always soothed under its influence; with a steadier circulation the *râles* in this case disappeared, diarrhœa, meteorismus, and perspiration ceased, and the urine pale and of low specific gravity, as it often is in these prolonged cases, was soon restored to its normal quality. What none of the eliminative means used had been able to effect now occurred. An increase in the elimination of urea, noticed in favourable cases, is aided by the salicylate of soda; it acts as a sedative without checking any of the secretions. The relief of pain is partly from its action on the central nervous system, more directly from the dilatation of the peripheral bloodvessels which it produces; at the same time excitability of the heart is lowered, hence its utility when the heart is already involved, while by its power to arrest the special febrile action, at whatever period of the disease it is given, no remedy can be so likely to prevent that complication. The earlier it is given and the sooner its effects are produced, the less likely is the heart to suffer, for the shorter the duration of the fever the less is the possibility of heart-disease. As salicylic acid is rapidly eliminated by the kidneys, the doses of it, or of salicylate of soda, must be frequently repeated. Salicine is but slowly and partially converted into salicylic acid. The acid is less easily and less safely administered than salicylate of soda, and is in no way more efficacious where no

germicide influence is required. The acid so readily and cheaply obtained from carbolic acid, since Kolbe's great discovery, has exactly the therapeutic properties of that prepared by Cahors from the wintergreen (*Pyrola*) as determined in 1855 by Bertagnini. Salicine, as first separated by Leroux from willow-bark, has been found by Senator and others to have no other action. The salicylate of soda is the readiest way of giving the remedy where its effects should be produced rapidly, a point of great importance in the young, and is exactly suited to what is required in the treatment of acute rheumatism.

Dr. ANDREW CLARK summed up the results of the discussion which the paper elicited, as follows: First, they had as yet no stable criterion whereby to determine the therapeutic effects of any drug upon rheumatic fever; they did not yet completely know the history of this fever. Secondly, therapeutic conclusions were apt to be vitiated by failing to distinguish between the two forms of the disease,—the continued and the relapsing form. Third, while the influence of salicylic acid and its compounds somewhat speedily relieved the *malaise* of which the rheumatic sufferer complained, it was extremely doubtful whether they in any degree diminished the peril of secondary cardiac or other inflammatory complications. Lastly, it was left uncertain whether they succeeded in removing that actual pathological state of which, in a sense, these other things might be said to be the expression. In short, there was almost a greater tendency to relapse with the salicylates than otherwise. Although this did not seem to be a very great gain, yet it was enough to help them in future inquiries.

#### *Recent Observations on Mumps.*

Mumps was known at a very early period of medical knowledge. Hippocrates left us a very faithful and minute description of the disease. But a great diversity of opinion as to its nature and etiology has always prevailed among medical authors. Some, and among these several leading practitioners, consider the affection to be local, brought on by taking cold; while others are of the opinion that it is the local indication of some general affection whose places of predilection are the glands, such as the parotids and testicles in man, and the parotids, breasts, and sometimes the ovaries, in woman. Those who consider mumps as a local affection differ in their opinion as to whether the disease is caused by acute inflammation of the parotid gland or by retention of the saliva caused by some obstruction of Steno's duct. The principal questions which remain to be elucidated on the subject are the following. Is it a local or general affection? Is it either a miasmatic or a contagious disease, or both miasmatic and contagious at the same time? Ought it to come under the head of fevers which accompany eruptions, or is it a disease which belongs to an entirely new group?

Further light has been thrown on several of these questions, especially as far as infection is concerned, by an able thesis by Dr. PINET of Paris, discussed in the *Journal des Connaissances Méd.*, January, 1879. The author, an army surgeon, has had ample opportunity of studying the disease closely in French barracks (where it seems to occur epidemically), and of tracing it to its origin. After giving a historical sketch of the labours of his predecessors on the subject, Dr. Pinet very carefully enumerates and analyzes a number of cases, and draws from them the following conclusions.

1. The affection must be considered as being general, not local; because, in certain cases, general symptoms have preceded the local ones, which manifested themselves in the form of affections of the parotids, testicles, prostatic gland, urethra, intestines, eyes, brain, etc.
2. It has never been known to occur twice in the same individual.
3. It occurs epidemically.
4. It is contagious.

As far as the etiology of the disease is concerned, the author ascribes it to



miasmatic and contagious causes, which both infect the whole organism; but he does not exclude the possibility of infection caused by the medium of outward circumstances and surroundings or individual predisposition. He traces back to these influences the first impression caused by the zymotic germs on certain organisms, where they find a fertile soil that is ready to receive them; as well as to their predilection for certain organs. It is well known that inflammation of certain glands may either exist alone or follow in the rear of some other similar inflammation. The prevailing idea as to this affection is that, although painful, it is harmless; but the disease is known to have given rise to serious complications, among them atrophy of the testicles, which seems to occur much more frequently than has been suspected. It either affects only one testicle or spreads to both, reducing them to the size of a nut or almond. Another and not less dangerous complication is disease of the kidneys, which manifests itself as albuminuria, uræmia, and œdema of the skin and extremities, and generally appears when the swellings of the glands have begun to decrease. In some cases the patients have died of uræmia; in others, a milk diet, combined with the internal administration of perchloride of iron, has proved successful.

The symptoms of mumps are not always clearly defined, so that often a doubtful case can only be diagnosed from the outbreak of an epidemic. Several such cases have been described by Dr. PENZOLDT in the *Deutsche Medicinische Wochenschrift*, August 19th, 1878, of which we give here a short sketch.

CASE I.—The patient, a boy aged 8, had complained of feeling hot and uncomfortable, and of pain during deglutition. The temperature was 104.6 deg. Fahr.; but no distinct changes could be traced either in the fauces or on the body, except a moderate swelling of the submaxillary glands and their surroundings. The next day the temperature had risen to 105. The left submaxillary gland was of the size of a pigeon's egg; the swelling had spread to the lower border of the left lower jaw. The right submaxillary gland was of the size of a nut, and the tonsils were red and swollen. The author suspected that there might be some complication with parotitis, but could find nothing except a small swelling on the left ear. During the two following days, the swelling gradually diminished, and the temperature fell till it reached its normal height. It is to be noticed that in this case the characteristic swelling of the parotid gland was absent, and that the lower part of the face rather presented the peculiar features of acute swelling of the tonsils, or tumours of the lymphatic glands. The author, however, was of opinion that the case was one of epidemic parotitis, which had probably originated from infection. There was then no trace of any epidemic of mumps; but nine days later several cases of acute parotitis occurred.

CASE II.—A boy aged 2 had felt unwell for a whole week; but no distinct symptoms could be found, except a swelling of the left submaxillary gland and a gland behind the ear. The temperature was 106.6 deg. Fahr. The swelling spread to the right submaxillary gland, and the patient recovered on the third day.

In a third case, there were fever and vomiting, but no characteristic swelling of the parotid glands. As, however, a few days later mumps broke out among the other children of the same family, this case may be considered as belonging to the prevailing epidemic.

These few cases tend to show how difficult it sometimes is to diagnose this affection. In such a dilemma, the possibility of an epidemic of mumps, of which similar cases seem to be in some respects the forerunners, ought always to be present in the physician's mind. He will be likely to find his suppositions verified after a certain time. The duration of incubation varies from nine to fourteen days. It is to be regretted that neither of the authors has made any observa-

tions on the treatment of the disease. Dr. Pinet specially might, with his experience, have given many a valuable hint also as far as regards the prophylactic treatment.

Jaborandi, according to Dr. TESTA (*Il Morgagni*, July, 1878), is a most powerful and efficient remedy. Its efficiency may be explained by its hydragogue and sialagogue properties; and if given in time it may prevent the affection from breaking out.—*British Med. Journal*, Aug. 23, 1879.

### *Study of Epidemic Cerebro-Spinal Meningitis.*

Dr. FREY arrives (*Wien. Med. Presse*, No. 22, 1879) at the following conclusions respecting the epidemic occurrence of cerebro-spinal meningitis. The outbreak of the affection is never accompanied by a prodromal stage. Children seem to be more liable to contract it than adults. It occurs both in plains and valleys and in mountainous countries. The disease begins with a severe chill, or a violent headache, the cervical muscles are contracted, the patient becomes delirious, has hallucinations, eclamptic fits, and opisthotonos. All these symptoms may appear at the onset of the illness, and continue for two or three days, if the patient has not succumbed in the course of the first few hours. At the end of the second or third day a remission occurs, the contractions of the cervical muscles and the headache cease, and the patient recovers consciousness gradually. This state lasts only for a few hours, when the former condition again sets in. In the course of the affection, remissions occur frequently, though they never assume a typical character. As far as the febrile movements are concerned they are entirely independent of the severity of the affection. Thus, in some cases the patient has been in a most dangerous condition, and yet the temperature has only been slightly raised. Other symptoms are: injection of the bloodvessels, of the conjunctiva, strabismus, œdema, hyperæsthesia of the skin, and consequently great restlessness. The thoracic and abdominal viscera are perfectly normal. In one case only the spleen has been found to be enlarged. The functions of the bowels are temporarily disturbed; no albumen in the urine. In two cases out of nine the author has observed skin eruptions—herpes in the corners of the mouth, and on the cheek, like the eruption in intermittent fever and pneumonia. In almost all cases there were hallucinations of hearing, and visual disturbances, photophobia, strabismus, diplopia, and amaurosis. The affection does not always terminate in death: in some cases the patients die within a few hours, in others they recover in the course of two or three weeks. Some die on the eighth day or sooner, while others are unable to leave their bed for eight to nine weeks or more, during which time they are both blind and deaf. These are the most hopeless cases, as far as the mental powers of the patients are concerned, for they are often subject to hallucinations, while at the same time their bodily weight increases, and there are no febrile symptoms. The question whether cerebro-spinal meningitis is contagious or not, has not yet been satisfactorily answered. In some cases, several individuals have been taken ill in the same house, while in others the patients were surrounded by a numerous family all through their illness, and yet no other case occurred. The treatment consisted in cold applications to the head and neck, large doses of quinine and salicylic acid; but neither of these remedies gave very satisfactory results. In cases of great restlessness morphia injections afforded some relief. Cold packs seemed to lessen the extreme irritability of the skin. Acting upon the idea that perhaps better results could be achieved by promoting the absorption of the exudation, the author prescribed ointment of iodine and mercury to be rubbed into the neck, and gave large doses of iodide of potassium, but there are no records of the effect in this treatment.—*London Med. Record*, Aug. 15, 1879.

*Tubercular Meningitis in Childhood.*

HENOCH considers (*Centralblatt Zeit f. Kindert*, May 1) that the only practical division of this disease into stages is that which gives a period of excitement and a period of paralytic symptoms. The duration of the disease is very variable, often scarcely eight days, and often as long as three weeks. A prodromal stage of a week or a month is not always recognized. Vomiting is one of the earliest and surest symptoms. It is repeated often in the earlier days of the disease, but later it disappears or occurs only in isolated attacks. The condition of the pulse is very variable. In nearly every case it is for a time slow and irregular, the irregularity being a symptom of great importance. Constipation is not a very reliable symptom. The author refers to cases which began with vomiting and diarrhœa, and were taken for cholera. The diarrhœa, however, stopped soon, while the vomiting persisted. The respiration is not much altered. The deep sighing inspiration, which is so important and certain a symptom, was noticed first in the cases observed at the onset of the second period of the disease. In the last twenty-four to forty-eight hours the Cheyne-Stokes breathing was almost constantly present. The accumulation of carbonic acid in the blood, in consequence of deficient respiration, and especially anæmia of the brain, are the causes of the final epileptiform convulsions. Henoch insists that tubercular meningitis must not be considered synonymous with basilar meningitis, as the purulent exudation and tubercles are not seldom seen on the convexity. Meningitis may even run its course without formation of tubercle on the pia mater, and if it succeeds to general miliary tuberculosis, will get the name of tubercular meningitis. The conspicuous symptoms are due to the inflammatory irritation of the pia mater, not to the formation of tubercle. General acute miliary tuberculosis may call forth cerebral symptoms, without participation of the pia mater; but these symptoms are very different from those of tubercular meningitis. In the former case the fever is continuously high, and the regularity of the temperature curve may give rise to a confusion of it with that of "typhus" (? enteric), or the curve is irregular, and then shows decided remissions and exacerbations. Limitation of the eruption of tubercle to the pia mater, or the brain-substance, to the exclusion of other organs, is very rare, and, when it is reported, gives rise to suspicion that the examination has not been thoroughly made. Tubercles are generally found in the spinal cord, and caseation of the bronchial glands or other organs is almost always seen. Out of eighteen cases only once was the latter appearance not present. In about half the cases tubercle or caseation was found in the lungs, pleura, liver; or spleen. Tubercle of the choroid is by no means constant.—*Lond. Med. Record*, Aug. 15, 1879.

*Hysterical Hemianæsthesia in a Man.*

At a recent meeting of the Society of Biology of Paris, Professor BALL showed a patient suffering from this curious affection, common enough in women but extremely rare in men. The case was one, Dr. Ball observed, of those evanescent facts which must be seized as they pass in order that they may not be lost to science. The patient was a young man twenty-six years of age, who had suffered since infancy from convergent strabismus. Some years ago, he was taken suddenly one morning with cyanosis of the ends of the fingers; his nails fell off, and ulceration occurred at the end of the fingers. The cicatrices of these old ulcerations could still be seen. Two years ago, the patient suffered from temporary loss of vision, occurring without any known cause. The malady of which he was now the subject began only five days ago. He had a violent altercation with his mother-in-law; at the close of it he suddenly became deaf and dumb. The loss

of speech lasted only twenty-four hours, the power of speech returning suddenly on the following day. But he remained deaf—at least in the left ear. Moreover, he was completely insensible on the whole of the left side of the body. He did not feel pinching on the left side, nor in the front, nor on the tongue, nor on the face. The whole of the right side, on the contrary, was the seat of extreme sensitiveness. The point of the tongue deviated slightly to the right. In a word, as regarded the phenomena of sensation, this man's body was divided into two halves by a definite line, as is seen in certain hysterical women. Neither vision nor smell was disturbed on the left side. The left eye distinguished colours as well as the right eye, and the left nostril received odours as well as the right. M. Ball concluded that the lesion was not organic but functional. He did not venture to adopt the word hysterical hemianæsthesia, which seemed to him too vague, as he believed these troubles of sensation to be the result of a nervous ischæmia. Such was not, however, the opinion of M. Magnan, who held that the characteristics of the affection were in truth those of hysterical hemianæsthesia. Metallotherapy was employed twice on this singular patient, a piece of gold being applied to his tongue for ten minutes; but no change was produced in the state of the general sensation.—*British Med. Journal*, June 21, 1879.

#### *Undescribed Cause of Reflex Vertigo.*

The following case is given by Dr. ERLÉNMEYER, in Nos. 44 and 45 of the *Deutsche Medicinische Wochenschrift* for 1878. The patient, a man aged 31, was suffering from stricture of the urethra, owing to gonorrhœa. For some years past, he had been subject to peculiar disturbances, which came on in the form of paroxysms. First, the left arm became stiff and heavy; then the left foot and the right arm (the right leg always remained free), the patient feeling as if his limbs were filled with lead. He never lost consciousness, but felt giddy, and had a strong tendency to fall to the left. This sensation of giddiness was also experienced whenever the patient would attempt to micturate, the limbs remaining free at such times. He complained of a continuous feeling of pressure on the forehead; had a gastric catarrh; the tendon reflex was much increased. Nothing abnormal could be detected in either his eyes or ears. Thinking that his central nervous system might be affected, he was first treated with nitrate of silver taken by the mouth, and enemata, and daily rubbed with cold water. Seeing that he derived no benefit from this treatment, the author next resorted to dilating the stricture of the urethra by means of bougies; and this time he succeeded in curing the patient. He describes this vertigo as *vertigo ab urethrâ læsâ*, but does not offer any explanation concerning the feeling of stiffness in the extremities.—*British Med. Journal*, June 14, 1879.

#### *Chorea, a Functional Disorder.*

At the recent meeting of the British Medical Association (*British Med. Journal*, Aug. 23, 1879) Dr. OCTAVIUS STURGES read a paper which was designed to show, from an examination of the ordinary phenomena of chorea, that the affection in its simple and uncomplicated form is not due to any lesion which is demonstrable anatomically; and that its symptoms are not otherwise to be explained than by reference to the general character of disturbed muscular movement, when the source of such disturbance is, directly or indirectly, a mental impression. This position it was sought to maintain by reference to (1) the age and sex of the patients; (2) the actual character and common associations of the affection; and (3) the modifications it undergoes at the various periods of life. The period of greatest motor activity is also the period when chorea is most frequent; the affec-

tion occurs to girls much more often than to boys; and as a general disturbance in young children, but as a local disturbance in those that are older. The limbs which chorea chiefly affects are the same which are chiefly concerned in intellectual uses, and which are on that account the most likely to suffer disturbance under mental excitement or over-strain. The frequent concern of the hands in the chorea of school-children, and the almost invariable participation of the face in the elder and self-conscious patients, were quoted among the facts admitting no other explanation. A similar transmutation of mental into motor disorder is to be met with, for example, in the hysteric fit, from emotion being exchanged at the height of the fit for pure spasm; also in children, who, in the most active-bodily exercise, are the nearest to emotion, and whose emotion is readily dispelled by bodily movement. In chorea, there is in fact a most intimate alliance of mental and bodily disorder, and this alliance becomes more and more conspicuous as life goes on—the chorea of childhood gradually blending with emotion as womanhood is approached. Choreia, unlike the over-movement of emotion, does not disappear when its cause is removed. This was explained by considering that the purposive movements are as yet defective and half learnt, and in need of care and direct attention. A disturbance of the kind supposed throws the child back to its early and untrained condition, and especially as regards the higher movements. At the same time, the efforts of the child to maintain stillness, and the extra observation it receives, contribute still further to the choreic restlessness. The common course and progress of chorea at various ages were next discussed; its tediousness, but almost certain recovery, in childhood; its severity at the time of puberty; and the fact that, when seen in its then modified form, in adult life, it is commonly an incurable affection, were referred to as indicating the analogy between chorea and all other motor disorders of a functional kind; the child finding the cure for its over-movement in the gradual strengthening of a control which comes with its development; the growing girl, at the time of puberty, having her disorder for the while increased by the mental exaltation of the time; while the adult, in the rare event of his reaching maturity without finding alleviation, has no reserve of hope in the future, like the others, but keeps his disorder for life. An apparent exception to this rule was quoted as being, in fact, an illustration of it. The adults who recover from chorea are pregnant women, and these becoming liable to the affection, owing to the nervous instability of the gestation period, retain it only so long as this condition lasts. Other points were enumerated, exhibiting chorea in the light of a functional disorder; such as the occasionally contagious character of the affection; the connection between the particular cause of the chorea and the limb which is made choreic; the changeful character of the disorder, whenever the patient is openly observed, or bidden to increase or to control particular movements; the fact that the choreic body will sometimes, though rarely, suddenly right itself, and the affection all at once disappear; the frequent recurrence of chorea to the same child in the same form, with no permanent damage, no actual illness; the almost certainty of ultimate recovery; and, from first to last, not one of the symptoms which we are in the habit of calling cerebral. In conclusion, the common objections to the functional view of chorea were alluded to. The author denied the asserted intimacy of connection between chorea and rheumatism. He admitted, however, that a severe form of chronic spasm (originally described by Addison), at first resembling chorea, but accompanied by delirium and pyrexia, and often rapidly fatal, has its direct origin in acute rheumatism. The connection is here (presumably in some cases and demonstrably in others) by way of embolism. This affection, however, is extremely rare; it occurs to young persons rather than to little children, and only at the beginning does it resemble chorea. A further objection to the functional

view is that founded upon the evidence of those comparatively rare cases where chorea occurs along with other affections plainly indicative of cerebral lesion. The *post-mortem* appearances found in such cases are, however, not to be attributed to the chorea so much as to the whole group of clinical phenomena taken together. Chorea is most often seen by itself, and, so occurring, no anatomical lesion can be ascribed to it. At the same time, pathological accidents, such as embolism or thrombosis, may, in predisposed persons, cause the early appearance of choreic movement. The author alluded to other exceptional cases; those, for example, when chorea spreads from the arm to the corresponding leg; or where one-sided chorea becomes one-sided spasm or hemiplegia; or where a lingering chorea, gradually increasing in violence as the child's health fails, contrary to the rule, is at last fatal from exhaustion. Such cases, he believed, compel the admission that the purely functional disorders may, in rare instances, eventually give rise to a central change, by reason of which not only does the disorder spread to other muscles dependent on the same centre, but what was at first mere muscular restlessness (or chorea) becomes converted into a real and abiding convulsion. With the presumed structural change, the symptoms here come to resemble those which depend upon various "irritative lesions" of the brain. Speaking, lastly, of the association between fatal chorea and recent endocarditis, as offering another difficulty in the way of accepting the purely functional theory, the author admitted that this concurrence is a well-established fact of pathology. It was argued, however, that the endocarditis (whose common mode of recurrence is described) is the consequence, and not the cause, of chorea; that heart-disturbance is often absent from first to last; and that the frequency of endocarditis in fatal cases does not represent its frequency upon the whole. Chorea must be accounted for independently of endocarditis, which latter, however occasioned, is not at any period of life one of its essential factors.

#### *Hypodermic Use of Fowler's Solution in Choreia.*

Dr. PERROUD, Lecturer on Diseases of Children in the Lyons Faculty, has treated (*Rev. Méd.* July 19) cases of chorea, since 1875, by hypodermic injections of arsenic, and M. Gavin in a recent thesis gives an account of thirty-three of the cases so treated. Four or five drops of pure Fowler's solution are injected by means of a Pravaz syringe, the region chosen being that where the cellular tissue is least dense and the nervous filaments are fewest. Generally an injection is practised every second or third day. All the cases were females aged from six months to fourteen years, and among them were examples of all the forms of chorea. This method is stated to be preferable, because it avoids all gastric disturbance, and the cure is generally obtained more rapidly while the dose is very small. There is little or no local irritation induced; but in some cases intolerance of arsenic occurs, although this is rare in children. As a general rule, rapid amelioration occurs, flesh being at the same time gained, while the solid matters secreted by the kidneys diminish. In sixteen of the cases the chorea was cured after a mean duration of thirty-two days of treatment, about eighteen injections having been employed. Of thirteen others submitted to these injections, but to various other modes of treatment as well, ten recovered, a longer period, however, being required. These thirteen cases were almost all of them old or relapsed choreas, so that, contrary to the assertions of Aran, Ziemssen, and others, arsenic seems to succeed better in recent and simple than in old and inveterate cases.—*Med. Times and Gaz.*, Aug. 23, 1879.

*Salicylate of Soda in Chorea.*

M. DRESCH communicates to the *Bull. Générale de Thérapeutique*, 15th June, 1879, the history of a case of chorea in which the movements disappeared in the course of eight days under the administration of salicylate of soda. The case seems to have been one of the most typical kind, the child herself, aged 10, being rheumatic, and her father epileptic. The salicylate was given to the extent of 6 grammes (about 90 grains) per day. During the first day each dose caused vomiting, and at night the child was sleepless. Tolerance of the remedy was established on the second day, appetite returned, the flow of urine was increased, and the choreic movements became less violent. There was also slight disturbance of sight and hearing. On the sixth day the administration of the salicylate was stopped; on the eighth day the child was well, and there has been no relapse.—*Glasgow Med. Journal*, August, 1879.

*Subcutaneous Injection of Ergot in Neuralgia.*

MARINO publishes (*Gaz. Clin. di Palermo*) the results of his experiments with ergot. 1. In tic douloureux local injections of ergot give better results than any other remedies, quinine included. 2. The results are equally good in hemicrania. 3. In some cases of sciatica very good results have been obtained, while in other cases no relief has been afforded to the patient. 4. Ergot should be administered in other cases of neuralgia, especially if the latter is caused by blood-poisoning or cachexia. 5. The injection itself is often painful, but abscesses do not often supervene. The pain generally ceases in half an hour, especially if a cold compress has been immediately applied to the place. The neuralgic symptoms, as a rule, disappear after one or two injections; but it is advisable to continue them for some time. 6. The dose for one injection varies from 15 centigrammes to 2 decigrammes of ergot dissolved in water or glycerine.—*London Med. Record*, July 15, 1879.

*Laryngeal Phthisis: Its Origin, Course, and Termination.*

Dr. MORELL MACKENZIE read a paper on this subject at the recent meeting of the British Medical Association (*British Med. Journal*, Aug. 23, 1879). He said: 1. Laryngeal phthisis is due to the presence and subsequent breaking down of tubercles in the mucous and submucous membranes. The tubercles, some very small and some as large as a millet-seed, are found imbedded in a reticular structure filled with small round lymphoid cells. This tubercular matter is sometimes deposited uniformly through the thickness of the mucous membrane, but much more commonly it is found in the most superficial layer of the mucous membrane immediately beneath the epithelium. In the deep layers of the mucous membrane, both the tubercles and the round cells are less abundant. Heinze has pointed out that there is sometimes a space between the epithelium and the subjacent tubercular deposit, containing a few round cells and many capillary vessels, but no tubercles. 2. Laryngeal phthisis is essentially a secondary phenomenon, occurring as a sequel to pulmonary phthisis. There is no evidence that any case of primary laryngeal phthisis has ever existed. 3. The disease is not due to the corrosive action of the sputa. This is shown by the following facts. *a.* In many cases of laryngeal phthisis there is little or no expectoration; *b.* The sputa in gangrene of the lung, which is probably much more corrosive, does not produce laryngeal ulceration; *c.* Lymphoid cells are sometimes found between the epithelium above and tubercle below. 4. The disease is much more common amongst males than females. Out of 500 cases examined by the author during life, 365

were males and 135 females. In a hundred necropsies, there were 73 males and 23 females. 5. The most frequently present symptom of laryngeal phthisis is impairment of the vocal function. In 500 cases, the voice was impaired 460 times. Cough was a marked symptom in 427 patients. Dysphagia occurred 151 times. 6. The naked-eye appearances of laryngeal phthisis, either during life or after death, cannot be absolutely relied upon, but pale pyriform swellings of the ary-epiglottic folds and a pale turban-like thickening of the epiglottis are seldom met with except in laryngeal phthisis. More or less uniform thickening, with marked pallor, of the mucous membrane and small scattered ulcers are the characteristic features of the disease. 7. The prognosis is always unfavourable. The ordinary duration of life after the throat-symptoms have become troublesome being from ~~twelve to eighteen months~~. 8. The only treatment which is of any use consists in the employment of palliative remedies. Where there is pain in swallowing, insufflation of morphia gives the greatest amount of relief.

#### *Multilocular Pleurisy.*

To distinguish whether a pleurisy is unilocular, bilocular, or multilocular, is a matter of *post-mortem* examination. Such was the proposition laid down in 1854 by Professor Wintrich, and it is still generally accepted. In a communication made recently to the Académie de Médecine of Paris, which has attracted much attention by reason of the remarkable display of eloquence with which M. JACCOURD enforced his views, that able clinical physician laid down rules based upon facts which he has observed since 1870, and which enable him, as he considers, to declare that diagnosis is possible, and that it may become an useful guide for puncture. The conservation of thoracic vibrations fulfilling certain definite conditions, and coinciding with a determinate *ensemble* of physical science, supplies, according to M. Jaccourd, the means of diagnosis. The object of his researches is to determine the conditions and the signs which specialize the generic fact of the conservation of the local vibrations. According to these observations, two perfectly distinct semeiological types must be admitted.

In the first type, on one side of a thorax presenting to the full the general sum of the ordinary signs of complete effusion, vocal vibrations are preserved along a line which extends to a variable height of the chest from the vertebral column towards the sternum in a more or less regular semicircular course. At all other points, vibration is abolished. In the conditions referred to, the existence of this vibratory zone, which is marked by its vibration from the rest of the thoracic wall which is mute, cannot indicate anything else than a band of pleural adhesion stretched by the effusion, which it divided into two cavities. As to the coincidences, they have been as follows: right displacement and depression of the heart; absolute and total dulness; no subclavian tympanism; at the level of the vibrating zone, bronchial respiration and voice-sounds; everywhere else, respiratory and vocal silence, except under the clavicle, where a distant respiratory *bruit* is heard, with confused humming of the voice.

In the second type, the vibrations are preserved, more or less weakened, in the whole extent of the dulness, except sometimes in a zone of from one to two fingers' breadth at the lower part of the thorax behind. In four cases of this type which were observed, the coincidences were remarkably uniform; absolute dulness, without elasticity; stone-dulness in all the supradiaphragmatic region; no subclavicular tympanism; in the same extent, striking bronchial *souffle* and bronchophony. This type of pleurisy is distinguished from scanty homogeneous serous effusions with the vibrations preserved. By the preservation of vocal *frémus*, it is not less removed from complete unilocular effusions with absolute dulness and with generalized bronchial effusions. In fact, this complex of symp-



toms has been allied, in the observations of a second series brought forward by M. Jaccoud, with the presence of a multilocular acute pleurisy. Such has been in these cases the precision of the signs, that M. Jaccoud believes himself authorized to generalize the teachings which result from them, and to say that every case of acute pleurisy which presents in a persistent manner the whole of these signs is a multilocular pleurisy with more or less multiplied secondary partitioning.

When, by the aid of these signs, the existence of a multipartite pleurisy has been recognized, can one go further in the diagnosis, and distinguish the situation of the fundamental partitions in such manner that the knowledge may direct the thoracentesis? M. Jaccoud has been able to do so in two cases in which he had recourse to puncture, and that because on the uniformly vibrating surface of the diseased side he found one or two zones where the vibrations were manifestly stronger than at other points. These zones of maximal vibration have been his guide for thoracentesis. But, if the discovery of the fundamental partitions in such a pleurisy be possible, it is not always so. The concurrence of signs on which it is based was defective in three cases which terminated in recovery. It was impossible for M. Jaccoud to discover on the affected side a regular and limited zone of stronger vibration; so that he was unable to arrive at any notion touching the respective situation of the divisions. This was one of the motives which decided M. Jaccoud to abstain from puncturing in these three cases. He had, besides, a more serious reason for abstaining; for he had acquired proof from the other cases that multilocular pleurisies do not bear thoracentesis satisfactorily.

It may be seen, from the foregoing, that the diagnosis of the multilocular disposition of acute pleurisy is a practical question of the first importance; in fact, a special prognosis arises out of this diagnosis. Even after recovery, this pleurisy is more serious than others, by reason of the adhesions which necessarily survive it. From this diagnosis follows, moreover, a therapeutical precept, which M. Jaccoud formulates in these terms. Multilocular acute pleurisy ought not to be treated by thoracentesis; puncture is only authorized in order to relieve in emergency the vital indication resulting from really imminent suffocation.

The study of multilocular pleurisy has raised, under the pen of M. Jaccoud, a second question: that of adhesions of the diaphragm. It is known that, in the ordinary pleurisy of the left side, the displacement of the heart furnishes a formal indication for thoracentesis, as a matter of urgency beyond even the consideration of dyspnoea. In multilocular pleurisy of the same side, the reasons for puncturing without delay are no longer the same. The dislocation of the heart has no longer so decisive a significance; it may even be valueless from this point of view. Indeed, from the mere fact that the pleurisy is multipartite, there is every chance that the pericardium may be fixed by adhesions in its vicious position; and, in these conditions, puncture, practised with the object of remedying the displacement of the heart, would be without any useful effect. The simple fact, then, of a cardiac ectopia, even though extensive, does not suffice to indicate puncture. To make this a legitimate indication, the physician must be able to establish, if not with certainty, at least with a satisfactory probability, that the thoracentesis will really diminish the displacement of the heart. Judgment on this point is possible up to a certain degree. The question consists in determining whether there is or is not antero-inferior effusion; but here great difficulties present themselves, the means of diagnosis being considerably retained in the left submamillary zone by the absence of all vibrations of *souffle* and of bronchial *ralentissement*. M. Jaccoud believes, however, that he has arrived at this end by an indirect method. In the course of a multilocular pleurisy, as in the course

of any other pleurisy, this left submammary region necessarily presents in its depths one of the three following conditions. It is diseased, without effusion; it is healthy; or it is changed by the presence of an effusion, by adhesions of the lung, of the pericardium, of the diaphragm, and the ribs. In these cases, the negative phenomena arising from the absence of vibration, from respiratory and vocal silence, are the same; but, if the region be intact in its depths, there is not ordinarily any displacement of the heart. The respiratory movement of the epigastrium and of the hypochondrium has its physiological regularity, and percussion shows that the acute tympanism due to the presence of the stomach and the colon has its normal qualities and extent; that is to say, it reveals the perfect conservation of the tympanic space, known in semeiology as the semilunar space. ~~When the region is altered in its deep constitution, whether by effusion or by adhesions, there is cardiac displacement, and the inspiratory rising of the epigastrium and the ribs has no longer its regular rhythm.~~

This observation made, it remains to distinguish from each other the two kinds of alterations. The differential signs are furnished by percussion and by the examination of the respiratory mobility of the region. Percussion is insufficient to distinguish with certainty a submammary effusion from one with forced membranes and adhesions of the diaphragm to the ribs. It is indispensable, in order to determine if the modification noted be due to the presence of a fluid, or to diaphragmatic adhesions, to have recourse to a second sign, furnished by the respiratory mobility in the costo-epigastric zone. In the case of adhesions, not only can there be ascertained the reversal of the normal movements of the epigastrium and of the hypochondrium; but, further, one sees this pathognomonic fact; at each inspiration, an active depression of the inferior intercostal spaces, starting from the sixth or the seventh; with this depression coincides, to the same extent, a traction of the ribs themselves towards the median line. The expiration is signalized by the return of these parts to their regular position—that is to say, by an epigastric projection and an eccentric projection of the ribs and corresponding spaces.

The importance of these clinical facts is considerable. In the cases which have been cited, and of which M. Jaccoud brought forward several examples, thoracentesis would have been practised at the point general considered as the point of selection, and the trocar would have been plunged into the abdominal cavity. Such a misfortune happened to a hospital physician, who very loyally published it. The consequence of these cases is the obligation to study the adhesions in every case of pleurisy, as an indispensable element in diagnosis—an obligation which is the closer because these diaphragmatic adhesions are not rare. The interest of this subject is not limited to the domain of the multilocular pleurisy; every case of pleurisy may present these anatomical conditions; and the determination of the state of the diaphragm must henceforth become an integral part of the diagnosis of the disease; and, as M. Jaccoud adds, there exists no relation, either direct or inverse, between the abundance of the effusion and the existence of the adhesions, these ought to be looked for in every case, abstraction being made of all the other specialties of pleurisy. This appreciation is, in his view, a preliminary condition of absolute necessity for thoracentesis.

Finally, it results from these facts that it is not desirable to assign, even in a general manner, any place of selection as the space, according to rule, for the puncture of the chest in pleurisy; the point of puncture, guided above all by the eventuality of pulmonary and diaphragmatic adhesions, necessarily varies in different patients; and the belief in any fixed rule would constitute a danger arising afresh with each patient.—*British Med. Journal*, June 14, 1879.

*Cases of Phthisis treated at High Altitudes.*

Dr. C. THEODORE WILLIAMS, Physician to the Hospital for Consumption, Brompton, discusses (*Lancet*, Aug. 16, 1879) this subject. He finds that the influence of mountain climate may be described, in its general aspect, as intensely stimulating. The appetite is increased, the digestion and assimilation are improved, the respiration is quickened, and also the circulation. This last is a very decided feature. The effect on the lungs appears to be chiefly the result of the inspiration of rarefied air, combined with the exercise taken. The chest measurements sometimes show a very decided enlargement after residence at high altitudes. Sometimes it is the affected side, sometimes the opposite one, which undergoes enlargement, due either to hypertrophy of the lung or ~~or by absorption of the consolidation or by hypertrophy and drawing over of the adjacent lung tissue, or again from localized emphysema~~. The principal change in the physical signs noted in nearly all the cases was rapid and remarkable diminution of dulness, even in old-standing consolidations. This may result either from absorption of the consolidation or by hypertrophy and drawing over of the adjacent lung tissue, or again from localized emphysema; but of the fact of diminished dulness Dr. Williams has no doubt. The decrease in frequency of hæmoptysis will, he believes, be demonstrated by important statistics about to be published by Dr. Spengler, and it has been insisted on by Dr. Hermann Weber and others. Mountain resorts are said to be contraindicated in cases of cerebral irritation.

Now what cases of phthisis are suitable for this treatment? It is difficult to select these accurately. Dr. Williams, however, says that the great points to bear in mind are—first, that the disease should be *limited*, and that no *large amount* of lung-surface should be involved; secondly, that no pyrexia, or tendency to pyrexia, should be present. During his visit to Davos last Christmas Dr. W. was surprised at the large proportion of pyrexia among the phthisical patients, which, considering the limited amount of disease (and that in an incipient form) which prevailed, is unusual, and different from the common experience in England. It seems to Dr. W. that the same influence which so powerfully stimulates the digestion, and causes the maximum of carbonic acid to be thrown off earlier than in the plains, exercises a corresponding influence on the inflammatory process, and converts what in England would be a passive congestion, with low temperature, into a well-marked pyrexial inflammation. Such is the stimulating influence of mountain air.

The patients who do best are instances of limited consolidation at one apex, or of limited cavity, or of hemorrhagic phthisis. In most of these complete arrest takes place; and what is most valuable in the mountain influence is, that it hardens people and makes them bear cold better afterwards. The cases of phthisis where mountain treatment is contraindicated are—all febrile patients, and those in whom the lungs are largely involved. These patients suffer terribly from the rarefaction of air, and also from the cold; and whereas at lower levels they appear merely as pale, weakly-nourished individuals, here they have blue extremities, livid countenances, never can keep warm, and present a picture of respiratory misery. Cases of laryngeal phthisis and of double cavities, cases with extensive fibrosis of the lung or with extensive pneumonic consolidation, all come under this category,

In conclusion, Dr. W. remarks that some of the cases narrated in his paper show clearly that, as regards patients suitable for a high altitude resort, at least two classes exist—(1) those benefited by the combination of cold and high altitude, and (2) those benefited by warmth and high altitude; and these points should be borne well in mind in the selection of climate.

*The Seat of the so-called Anæmic Bruit of the Cardiac Base.*

It has been CONSTANTIN PAUL's intention to prove that the seat of the anæmic or spasmodic bruit which is heard at the cardiac base is in the pulmonary artery. He has always preferred the use of the flexible to the rigid stethoscope. He reminds his readers that this bruit is a systolic one, and always to be heard on the left side of the sternum, and almost in every case in the left intercostal space near the sternum on the spot corresponding to the course of the pulmonary artery. The bruit may be soft or hard, and harsh; in the latter case, it is accompanied by a purring thrill and a loud second bruit, which corresponds with the tension of the sigmoid valves. He quotes ten cases in which he has observed this peculiar ~~bruit, and points out that~~ in every one of these cases a blowing sound could be detected in the jugular veins. In other patients we meet with a second type of the anæmic bruit. Here it extends beyond the second intercostal space, and can be detected in the three first intercostal spaces on the left side of the thorax, though it is loudest in the second space. The author groups in a third class all the cases where the bruit, though still systolic and on the left side of the sternum, is heard lower down, either in the second and third intercostal space, or in the third, or, lastly, in the third and fourth spaces. In a fourth series of observations, the bruit, although still situated in the pulmonary artery, can be heard as far as the apex of the heart. The author sums up his observations as follows: anæmia may cause blowing bruits in three different organs; viz., the jugular veins, the pulmonary artery, and the left ventricle. The bruit in the jugular veins is well known; the bruit in the pulmonary artery occurs very frequently; while the bruit in the left ventricle is only met with in rare cases. The anæmic bruit is heard in the second intercostal space, and is loudest at a distance of about two centimetres from the left side of the bone. It is systolic, and if at all prolonged, extends over the slight pause between the first and second sounds. Whenever the patient sits down or makes a prolonged effort, this bruit decreases; whenever he is made to walk quickly, the bruit increases.

The bruit which is most frequently met with is, as we have mentioned above, the one in the jugular veins. The bruit in the pulmonary artery is always accompanied by the jugular bruit. In cases where the mitral valve is affected, we are sure to meet with two other bruits: one of which is in the pulmonary artery, and the other in the jugular veins. When the patient begins to recover, the bruit over the bicuspid valve is the first to disappear; then the pulmonary bruit; and, lastly, the bruit in the jugular veins.

The bruits of the pulmonary artery are caused by two agents: anæmia and a spasmodic contraction of the vessels.

In the second part of his pamphlet, M. Paul gives the differential diagnosis between the anæmic bruit and the organic murmurs of the heart. The existence of a bruit in the jugular veins and of a blowing murmur in the left intercostal space, leads to infer that the patient is anæmic, and that he does not suffer from any organic lesion of the cardiac basis, or acute endocarditis, or stricture of the aorta; because, in both latter cases, the bruit would predominate on the right side. However, the author admits that it is very difficult to form a correct diagnosis in cases where two distinct noises are heard one on each side of the sternum, or where there is, besides the bruit in the jugular veins, another single murmur on the right side of the sternum.

M. Paul is of the opinion that the transitory bruits which are heard at the apex of the heart in cases of acute articular rheumatism are not always produced by endocarditis of the mitral valve, but may be owing to anæmia. He even asserts that this is always the case when murmurs can also be detected in the jugular

veins and at the cardiac base. He admits, however, that a third bruit, which is heard over the mitral valve, owing to endocarditis, may coexist with the two latter; but in this case it would be a permanent one. In other cases, the systolic murmur of the pulmonary artery may not be owing to anæmia, but to an organic lesion of the vessels. Again, in this case, the jugular murmur and the general symptoms of anæmia would help towards establishing a differential diagnosis.

Aneurisms of the aorta may also produce a blowing murmur on the left side of the sternum; but this could not easily be mistaken for an anæmic bruit, as it generally coincides with the second sound, and besides, the vascular lesion would always be recognized by the characteristic changes in the pulse.

The author concludes his paper by drawing a parallel between the extra-cardiac bruits and the anæmic murmur of the cardiac base, ~~which is much more constant than the former, which vary very often, and are constantly modified by respiration.~~—*London Med. Record*, June 15, 1879.

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*Sounds and Bruits of the Heart and the Aorta, which can be heard at a certain distance from the Patient.*

Professor EBSTEIN has published a summary of the few cases mentioned in medical literature in which bruits of the heart and thoracic aorta could be heard at a distance of half a metre or a metre from the patient. The author speaks first of the cases where the heart-sounds alone presented this peculiar phenomenon, then of those cases where bruits of the heart and the aorta could be heard at a considerable distance. As far as the latter are concerned, it is worthy of notice that both pericardial, as well as systolic and diastolic endocardial bruits, can be heard at any distance. Among the endocardial bruits, those which are caused by stricture of the atrium of the aorta are often heard at a distance, more especially so if they are owing to the formation of calcareous deposits on the semilunar valves. No case of disease of the bicuspid valves is recorded in literature where the bruit could be heard at some distance. The author then proceeds to give the history of a case which came under his own notice, where a very considerable stricture of the aorta was complicated with insufficiency and stricture of the mitral valve, and a systolic bruit could be heard at a distance of at least two metres. He then goes on to investigate the question whether bruits which present all the characteristic phenomena of cardiac bruits, can be heard at a distance in cases where neither the heart nor any of the great vessels are affected. He quotes two cases where this peculiarity has been observed. One is that of Professor Baum in Göttingen, who is now 78 years old and perfectly strong and healthy, and who has never presented any symptoms which might lead to suspect that he was ever troubled with disease of the heart. It appears that this gentleman during three years, from 1854 to 1857, heard distinctly a sound, resembling that of a flute, which issued from his chest, and was synchronic with the heart-beat. The sound was particularly clear and distinct at night. Dr. Spiers, of Frankfort-on-the-Main, is said to have observed the same sound in himself; it vanished after some time. Professor Baum has observed a similar phenomenon in a clergyman who was perfectly healthy. The sound could be heard day and night, but disappeared in the course of time.—*London Med. Record*, Aug. 15, 1879.

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*On Traumatic Ruptures of the Heart.*

In considering these injuries, M. TERRILLON states (*Le Progrès Médical*, March 29th and April 5th) that fractures of the ribs, driving inwards of the sternum, and the penetration of missiles, are the ordinary causes of traumatic cardiac ruptures; three sorts of lesions may be thus produced.

1. More or less extensive rupture of the cardiac walls, with death rapidly ensuing.

2. Contusions and ecchymoses of the heart's muscle; these, at certain parts of the organ, do not seem to exert any influence on its movements.

3. An internal rupture of a valve, of the cords, pillars, or even the septa, may take place. These lesions may for a certain time leave the functions of the heart intact.

The following cases are brought forward :—

I. (Prescott Hewett)—The patient was twelve years of age, and died four hours after a fall. An examination showed an ecchymosis, and slight tear of the cardiac wall, with a rupture of some of the columnæ carneæ in the left ventricle.

~~II. (Todd)—A man, aged 44, was stabbed under the left nipple; a recovery took place, the patient not dying until three years afterwards. The anterior segment~~ of the tricuspid valve was found to have been ruptured and hung loose in the ventricular cavity. The columnæ carneæ were atrophied.

III. (Deizeimens)—Man, aged 21, kicked by a horse in the chest and knocked backwards. Was able to get up, put on his hat, and walk towards the stable, but fell dead as he was going. At the *post-mortem* it was found the sternum had been fractured (although there was no trace of a blow) four and a half inches above the xiphoid cartilage, the lower fragment being depressed. The pericardium was filled with yellowish serum and coagulated blood.

At the anterior part of the right auricle, there was a muscular rupture half an inch in extent; an incomplete tear also existed at the circumference of the auriculo-ventricular orifice, and there was a third fissure in the ventricular septum. IV. (Terrillon)—Man, aged 48, attempted suicide by firing a metal tube filled with iron ingots into his chest. When brought to the hospital, an hour and a half afterwards, the patient could hold himself erect, walk, and get into bed, in spite of difficulty of respiration. An external wound, large enough to admit the thumb's tip, existed at the anterior part of the seventh rib, on the left side of the chest. Death took place in twelve hours. It was found that a missile had traversed the left thoracic cavity obliquely, and lodged in the vertebral column. The heart was pushed to the right side under the sternum. The pericardium contained a little sanguineous serum. On the anterior surface of the left heart, near the apex, there was an extensive ecchymosis, without any solution of continuity, the bloody infiltration reaching the endocardium. At the apex of the interior of the ventricle an adherent clot, the size of a thumb, was found, the muscoli papillares and chordæ tendineæ in the ventricle being ruptured and floating. This contusion is stated by M. Terrillon to have been caused by the ribs and costal cartilages at the moment they received the shock of the projectile.

V. (Richet)—Man shot himself with a revolver. Death ensued in a few hours. The ball had pierced the pleura, and the pericardium over the apex of the heart had been injured. In the sac was found a teaspoonful of blood, and at the apex of the ventricle there existed traces of an extensive contusion.

M. Terrillon considers the mode in which these ruptures are brought about. If the injury be received during the systole of the heart, the state of contraction predisposes the rupture to take place at the point struck, probably the ventricular wall, but the shock, if of sufficient force, may also be communicated to the pillars and septa, and cause there, also, a solution of continuity. If the force be applied during the stage of diastole, the cavities of the organ are filled with blood and communicating, so that the excentric compression would produce a tear in the resisting valves or the septum; hence a rupture of these parts, with no, or at most very slight, traces of an ecchymosis of the cardiac walls.—*London Med. Record*, July 15, 1879.

*Complete Occlusion of the Vena Cava Inferior with Malignant Disease of the Liver.*

Dr. LITTLE reports (*Trans. Dublin Path. Soc.*, Dec. 1878) the following case which occurred in a man aged 26. The duration of his illness was only three months. The veins of the trunk were much enlarged and varicose, particularly those occupying the front and the lateral axillary line. The blood in these coursed upwards. There was no ascites at first, but it appeared later. The urine was icteric. The inspection showed a much enlarged liver, due to many spherical masses of cancer; and the disease appears to have been a primary one of the liver. The inferior cava was quite obliterated in its passage through the liver for an inch of its course. The closure had taken place ~~above the junction~~ of the hepatic veins, and just before the vessel pierces the diaphragm, and in close proximity on each side were the largest cancerous tubercles. The anastomosis had been carried on in three principal systems. (1) The epigastric veins anastomosing with anterior intercostals and internal mammary. (2) The circumflex iliac veins anastomosing into the long thoracic. (3) By the enormous enlargement of the vena azygos, which was as large as the vena cava ought to have been. [Dr. Little alludes to the extreme rarity of pathological obliteration of the vena cava inferior, and states that he has only been able to discover one other case so complete as this. That may be so, but occlusion by clots and tumours is not by any means so very rare, and that they are not to be found in pathological literature must not be taken as evidence that they are rare. Like many other conditions, they are to be found recorded in the post-mortem records of hospitals, but not in any large number.]—*London Med. Record*, Aug. 15, 1879.

[The reader is referred to a case reported by Dr. Osler, of Montreal, *vide* the number of this JOURNAL for July, 1879, page 239.]

*Two Cases of Perforation of the Œsophagus.*

Dr. LESSER relates (*Deut. Med. Woch.*, No. 13, 1879) two cases of perforation of the Œsophagus, which were treated in the Augusta Hospital in Berlin, and for which he is indebted to Professor Senator. The first case is that of a man who had for the last four months been suffering from an increasing difficulty in swallowing. He was at last obliged to subsist entirely on liquid food. When examined at the hospital, an obstruction was found in the lower portion of the Œsophagus. The treatment consisted in gradually introducing thicker sounds into the Œsophagus, till the obstruction had been apparently removed; the patient, on leaving the hospital, was able to take solid food without much difficulty. Three weeks later he came back, feeling much worse. He was unable to swallow liquids. The next day, on attempting to drink, he had an attack of coughing, and expectorated two clots of blackish blood; after which he felt better, and able to swallow. During the following days, the stools were black. It was noticed that the patient, when lying on his right side, had a severe attack of coughing whenever he attempted to swallow, and complained of a sensation as if the liquid had penetrated into the right side of the thorax. He had no difficulty in swallowing when lying on his left side. The sputum contained, besides pus and a few red blood-corpuscles, a great quantity of ciliated cells. It did not smell offensively. The ciliated cells were expectorated until the death of the patient. At the *post-mortem* examination, a large ulceration was found in the middle of the Œsophagus, which occupied its whole circumference; its edges were thick and swollen. The portion of the Œsophagus which was to the left of this ulceration adhered firmly to the right aorta, and on the right side to the right lung. In this place, there was an opening of the size of a sixpenny piece in the Œsophagus,

which communicated with a large gangrenous cavern in the right inferior lobe of the lung. The cavern contained some liquid of a greenish tint, which had no fetid smell. The swelling in the œsophagus was examined microscopically, and turned out to be a caneroid. The second case presented very similar symptoms, except that the patient could not swallow liquids without having a severe attack of coughing, during which the fluid was expectorated. As he was in a state of extreme emaciation, it was impossible to examine him very thoroughly when admitted to the hospital. It was, however, supposed that there existed a communication between the œsophagus and the trachea, or a bronchus. He died suddenly, after a short stay in the hospital. At the *post-mortem* examination a large aneurism of the arch of the aorta was revealed, which had a small opening to the right. ~~The tissue between the aorta, spinal column, and œsophagus, was of~~ blackish hue, as was also the periosteum of the corresponding ~~part of the~~ The periosteum was detached from the bone in one spot, and the bone exposed. In the corresponding portion of the œsophagus there was an opening about two centimètres long, of irregular, oblong size, the upper edge of which was formed by a fold of normal mucous membrane, while the lower edge was also of a blackish hue. Underneath this opening was a small depression in the anterior wall of the œsophagus. The anterior rim of this depression was partly covered by a fold of mucous membrane, and in its centre was a round hole of about three millimètres in diameter, which led into the left bronchus, which was situated beneath it, and adhered firmly to the œsophagus. The stomach and œsophagus contained large blood-clots; the intestines were also filled, to a great extent, with clotted blood. The depression in the œsophagus, which corresponded to the spot where the latter adhered to the left bronchus, corresponds exactly to the "traction-diverticle," which has been described by Rokitansky and Zenker. What the immediate cause of the perforation was is not clear. Perhaps it was caused by suppuration, owing to some particles of food which had penetrated into the diverticulum, and produced inflammation. The aneurism was an independent affection, probably caused by a syphilitic infection of long standing. The pressure which it exercised on the mucous membrane of the œsophagus had evidently been the cause of the ulceration which finally perforated into the aneurism, and thus led to the final bursting of the latter. We have, in this case, a primary perforation of the œsophagus, owing to the formation of a diverticulum, and a secondary perforation caused by the pressure of an aneurism.—*London Med. Record*, July 15, 1879.

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*Case showing peculiar Auscultatory and Percutatory Gastric Phenomena.*

At a meeting of the Medical Society of Leipzig, Herr STRUMPELL (*Berl. Klin. Woch.*, No. 30, 1879) presented a patient with peculiar gastric phenomena. The patient enjoyed good health until her eleventh year, when she began to suffer occasionally from slight gastric disturbances, such as a feeling of pressure in the stomach after food, etc. About this time, the patient first began to manifest the peculiar gastric noises with which she is now troubled. A loud rolling noise is heard, loudest when the stomach is only half filled with food, which is isochronous with the respiration, consisting of two distinct parts, an inspiratory and expiratory one. When the patient holds her breath, the noise immediately ceases, and only a few isolated splashing sounds are heard by placing the ear directly over the stomach. If the stomach is empty, or the patient has been fasting for some time, the sounds can hardly be heard, but they appear again if liquid food is swallowed. If the stomach is filled with fluid food, the sounds become again weaker. They are very loud when the patient stands up or sits, and can at such times be heard all over the ward. When she lies in bed the sounds again grow weaker,



and can only be heard by putting the ear close to the stomach. If the hand is placed over the gastric region while the noise is loudest, the rolling sound is felt very distinctly; it seems as if at every inspiration air were driven from the epigastric region downwards and towards the left, and then went back again. If the stomach is percussed about a hand-breadth below the left lower edge of the thorax, a full deep tympanitic sound is obtained during inspiration, which during expiration alters into a high tympanitic tone. The stomach appears on the whole slightly dilated. The other organs are healthy. It is almost impossible to give a satisfactory explanation of these phenomena. The sounds are evidently caused by the air being squeezed, by the moving of the diaphragm, from one space into another which contains water. During expiration, the air is sucked up and drawn back into the first space. It has been suggested ~~that there may have been a hernia of the stomach~~, or that there may exist a partial gastric hernia.—*Lond. Med. Record*, Aug. 15, 1879.

#### *Inflammatory Fungoid Neoplasm.*

At the late meeting of the American Dermatological Society (*Med. Record*, Sept. 13, 1879) Dr. DUHRING presented a supplementary history of the remarkable case which he had shown at the preceding meeting (see number of this Journal for January last, page 259). After October, 1878, the patient continued to exhibit signs of increasing cachexia, although a striking characteristic of her case was the variability of her condition from day to day. She suffered much from the profuse suppuration of the lesions, which was accompanied by the most extreme fetor. The consolidated tumors on the forehead increased to an enormous size, and at last presented a striking resemblance to a huge roasted tomato. As it gave her so much annoyance, and she was exceedingly anxious for the operation, it was finally removed by the galvano-cautery, and although the growth was remarkably vascular, there was no hemorrhage whatever. This was true, also, of the removal, in a similar manner, of a large tumour in the popliteal region. In this respect a striking contrast was presented by the two former operations, which were described last year, and which, as they were performed with the knife, were accompanied by a large amount of hemorrhage.

The case resulted fatally early in the month of May, 1879, and at the autopsy it was found that none of the internal organs were affected with the disease except the bladder, on the walls of which there was a growth corresponding in character to those on the exterior portions of the body. After a careful study of the whole case, Dr. Duhring concluded that the affection was, in all probability, of an inflammatory nature, although some of the microscopical features of the specimens from it seemed to point towards sarcoma.

#### *The Use of Iodide of Starch in the Treatment of Lupus Erythematoses.*

In a paper read at the late meeting of the British Medical Association (*British Medical Journal*, August 23, 1879) Dr. MCCALL ANDERSON, after remarking on the obstinate way in which this affection resists internal remedies, stated how he was first induced to try the administration of the iodide of starch, it having been employed with the most happy results by Dr. Colligan, of Paisley, in a case in which all the ordinary remedies failed to make any lasting impression; and Dr. Anderson now regarded it as a valuable addition to our means of combating this most obstinate disease. The following is the formula for its preparation. R.—Iodi, gr. xxiv; amyli, ʒj. Triturate the iodine with a little water, gradually adding the starch and continuing the trituration till the compound assumes a uniform blue colour, so deep as to approach black. The iodide should be dried with a heat so gentle as to run no risk of driving off the iodine, and it

ought to be kept in a well-stoppered bottle. On no account should spirit be used in its preparation instead of water. The dose is a heaped-up teaspoonful in a draught of water or water-gruel thrice daily; but it may be safely increased even up to an ounce in some cases. In using it, care must be taken, first, that the cases are really undoubted cases of lupus erythematodes and not lupus vulgaris; and, second, that the medicine is freshly prepared, and in accordance with the directions above mentioned.

#### *A Rare Nodose Condition of the Hair.*

At the recent meeting of the British Medical Association Dr. WALTER G. SMITH, of Dublin, exhibited and described specimens of a remarkable affection ~~on which he had lately~~ come under his notice. A healthy girl, aged 19, applied for advice concerning partial loss of hair, which began ~~to appear~~ four years ago without any apparent cause. Previously to that time, she had always possessed a good head of hair, reaching down to her shoulders. The hair was uniformly thinned over the whole scalp, and the longest hairs measured about five inches. Upon close inspection, a singular appearance was noted. Nearly all the shorter hairs presented a regular succession of swellings along the shaft, one nodosity corresponding, on an average, to one *millimètre* of length of hair. The eyebrows were thin; but no beaded hairs could be detected either among them or in the eyelashes. The axillary hair was scanty, but normal; and on the pubes one hair was found with three of the characteristic fusiform swellings. The microscopical characters of the affected hairs were very remarkable, and were illustrated by drawings and specimens. There was scarcely a trace of scale-imbriication on the nodules; but it was tolerably well marked in the contracted portions. Brown pigment was deposited outside the axis in streaks, much more abundantly in the nodes; and thus each hair, viewed by the naked eye, presented the appearance of being checked alternately brown and white. There was no trace of cells in the axis of the nodules. No account of this curious condition had hitherto been published; but Dr. R. Liveing had a similar case under his charge some years, the details of which were given in the paper. Dr. Walter Smith took occasion to point out that these nodose hairs exhibited no evidence of any fungoid elements, and that they could not be confounded either with piedra or with the trichosyphilis of Wilson. From trichorexis nodosa, with which it might be supposed they had affinity, they differed in several particulars. 1. There was little tendency to partial fracture of the cuticle, or brush-like splitting of the cortex. 2. The nodose hairs occurred in multitudes on the scalp. 3. When a hair was broken, the fracture was usually clean, not fibrous, and occurred through a constriction, never through a node. 4. The nodes were opaque, and constituted the darkest parts of the hair. 5. The nodules were very numerous, and succeeded each other in regular order like beads on a necklace.

Dr. McCALL ANDERSON (Glasgow) had examined the hairs, and found they were not parasitic. Though trichorexis nodosa was rare on the head, yet he was familiar with it in that situation. He thought that this condition was closely allied to trichorexis nodosa, though not exactly the same.—*British Med. Journal*, Aug. 23, 1879.

## SURGERY.

### *Antiseptics on the Battle-Field.*

At the eighth Congress of German Surgeons, Prof. ESMARCH, of Kiel, observed (*Wiener Med. Wochenschrift*, June 7) that in 1875 he had given some

very positive directions as to the employment of antiseptics during battle, but as these had been either disputed or misunderstood, he felt desirous of again bringing them forward, with some explanations. He sets out from two maxims—one being that although the exact carrying out of the antiseptic method may be difficult, yet the surgeon should be so penetrated with its principles that he should make it his guide in any treatment adopted. The other is, that the surgeon must before all things be careful that no harm is done to the wound by unnecessary probing, the introduction of unclean instruments, the application of undisinfected dressings, etc. For the earliest aid to be given to the soldier on the battle-field, Prof. Esmarch has devised a dressing-pocket which every soldier can take with him in place of the charpie hitherto used. It contains, wrapped up in parchment-paper, a triangular cloth, a piece of stiffened gauze ~~bandage and two antiseptic balls~~, ~~the one~~ consisting of salicylated wadding surrounded by carbolized gauze. Such a dressing serves for by far the greatest number of injuries received in battle. In favour of its use it may be stated—(1) most injuries in battle are simple gunshot wounds; (2) hemorrhage, as a rule, is very slight; (3) the secretion from the wound is very small, and remains so if the wound is managed antiseptically; (4) the most severe wound remains in an antiseptic condition if an antiseptic scab is once formed over it; (5) the ordinary charpie is positively detrimental to the formation of such a scab; (6) the antiseptic balls contribute much to its formation; (7) the antiseptic balls can be sufficiently protected by wrapping them in gutta-percha paper. The antiseptic balls should be applied directly to the wound, covered with gutta-percha paper, and fixed on by means of stiffened gauze. This dressing can be kept moist by any suitable fluid the soldier may have about him, such as water, wine, or brandy. The triangular cloth may be used to keep the wounded extremity in a quiet position. In order to apply such a dressing no technical knowledge or acquaintance with the antiseptic method is required. The packet should not be kept in the soldier's pocket, but sewed into some safe part of his uniform. Prof. Esmarch has had no opportunity of trying his dressing-packets, but the trials made of them by Drs. Bergmann and Reyher during the late Russo-Turkish war have strengthened his conviction of their utility.

At the same Congress, Prof. PAUL BRÜNS, of Tübingen, gave an account of a substitute for Lister's gauze, which is very suitable for military practice. To four hundred grammes of resin that has been passed through a very fine sieve are gradually added two litres of spirit, constantly stirring for the fifteen or twenty minutes required to dissolve the resin. After this has been completely dissolved, one hundred grammes of carbolic acid and eighty of castor oil are added, stirring until thoroughly mixed. In time of peace, for the castor oil one hundred grammes of melted stearin may be substituted; but the solution will then have to be made at a temperature of 15° Réaumur. With this, from twenty-seven to thirty metres of unstiffened gauze is impregnated by the mixture being equally diffused over it in large flat vessels. The bandage material is then dried, in order that the spirit may evaporate, this taking place in five minutes in the open air in summer, and in from ten to fifteen minutes in a moderately warm locality in winter. The material so prepared will remain unchanged for months if kept in a tin box. For use in war time, a concentrated mixture may be prepared and kept in air-tight bottles, to be diluted with spirit before spreading on the gauze. The advantages of this gauze so prepared are—1. That it is a complete substitute for the Lister dressing. 2. It can always be prepared quite fresh. 3. It produces no irritation of the skin. 4. It can be prepared in half an hour. 5. Its price is only half that of Lister's gauze. Even this price can be greatly reduced by boiling the gauze that has been used, and reimpregnating it. This in

nowise interferes with its antiseptic quality; and, as the same gauze will bear ten or fifteen boilings and impregnatings, it becomes a very cheap preparation.—*Med. Times and Gazette*, Aug. 23, 1879.

#### *Catgut as a Source of Infection.*

Prof. ZWEIFEL, of Erlangen, reports (*Centralb. f. Chir.* No. 12, 1879) a case where twelve days after closing a very small vesico-vaginal fistula with a catgut suture, the patient had pyæmia and died. The *post-mortem* examination proved that the infection could only have taken place from the pelvis. The instruments used for the operation had been kept in carbolic acid for many hours before the operation, ~~so that the infection could only be ascribed to the catgut.~~ Professor Zweifel was confirmed in his suspicion by reading an article in a foreign journal where a similar occurrence was related. It had been a case of ovariectomy. The operation had been performed with all possible antiseptic precautions, and the patient had died of pyæmia. This led to a microscopic examination of the catgut, which was found to contain bacteria. Herr Zweifel had some catgut which he was going to use in an operation for ovariectomy examined under the microscope, and a large number of bacteria were discovered in it. As the catgut had always been kept in carbolized oil, this seems to prove that bacteria possess a certain immunity against carbolic acid. In what way the microscopic organisms penetrated into the catgut is not quite clear. The author thinks that it is very probable that they may have been developed even in the well-stoppered bottle, as carbolic acid is very apt to evaporate, especially if kept in a warm room. This circumstance may possibly explain many cases of death from pyæmia, which has supervened in spite of the most elaborate antiseptic precautions.—*Lond. Med. Record*, Aug. 15, 1879.

#### *Treatment of Cancer of the Thyroid Body.*

Dr. C. KAUFMANN, of Berne, in the concluding section of an elaborate contribution on malignant struma—primary sarcoma and carcinoma of the thyroid body, gives the following instructions as to treatment (*Deutsche Zeitschrift für Chirurgie*, Band ii, Heft 5 and 6). Extirpation has been rarely performed, and, in most instances, with a fatal result. The attention of surgeons has, however, again been directed to this operation in consequence of the success that has recently attended its performance in two cases of cancer of the thyroid body under the care of Billroth. The prospects of recovery after such proceeding can never be regarded as favourable, but still the question of operative interference is usually considered in the presence of a certainly fatal affection of any superficial organ. Two operations have been proposed for the removal of cancer of the thyroid; scooping out of the growth—*évidement*, and extirpation. The former operation is applicable only to recent cases and those in which the morbid growth is not very extensive. The structure of the tumour must be soft and pulpy. *Évidement* is a much less dangerous and less difficult proceeding than extirpation. The success of the operation will depend, on the one hand, on the removal of the whole of the growth by sharp spoon and cautery, and, on the other hand, on the absence of any metastatic growths. When the cancerous growth is large and its structure firm, no operation short of total removal of the thyroid body can afford any chance of permanent relief. This operation, to be successful, must be performed at an early stage of the disease, since primary cancer of the thyroid body is speedily associated with metastatic deposits in other organs. These conditions being favourable, the operation is further indicated when there is no very extensive adhesion of the skin to the front of the diseased thyroid body, when the tumour rises during movements of deglutition, and so does not

extend far towards the mediastinum, when the borders of the tumour are well defined, and when the whole mass is freely movable in all directions.

Unfortunately, it will always be very difficult to make out before operating whether there be any adherence or not of the tumour to muscles, large vessels, trachea, and œsophagus. Extirpation, even when performed under the most favourable conditions, must necessarily be a prolonged and tedious operation. The administration of an anæsthetic is usually attended with much difficulty in consequence of stenosis of the trachea, an almost constant result of malignant enlargement of the thyroid body. Whether in cases of isolated disease of one lobe, the whole thyroid body, or merely the affected part, should be removed, would depend on circumstances, especially on the size of the portion of gland remaining free. The safer course would be total removal.

~~The~~ of extirpation, if applied at an early stage of the disease, and with attention to antiseptic measures, will, in future, have better results. In too many cases, however, of cancer of the thyroid body, the patient applies for relief at a late period, and when the growth has attained a considerable size, and has contracted extensive adhesions to the skin in front of the neck, and to the trachea, œsophagus, and other important deep-seated structures. With extirpation, as with *évidement*, the chief element of success consists in submitting the patient to operative interference at the earliest possible period. The rule that applies to the management of other superficial malignant growths applies with still greater force to like disease of the thyroid body; the sooner the surgeon interferes the more easily will the operation be performed, and the more complete will be the cure.

When the disease is too far advanced to permit of any operation for its removal, the treatment should be directed to the relief of the effects of tracheal stenosis and of difficulty in deglutition, and to the reduction of profuse and exhausting discharges of pus from the ulcerated growth. The relief of the patient in a case of tracheal stenosis from the pressure of the enlarged thyroid body is usually attended with much difficulty, in consequence of displacement of the air-tube. The only operations that can be performed for opening this tube are crico-tracheotomy and inferior tracheotomy, and of these, the latter, when practicable, is to be preferred. The former may be attended with this disadvantage: the canula being applied at the seat of the stenosis is liable to cause, through pressure, perforation of the wall of the trachea, and so to favour the penetration of portions of the malignant growth into the air-passages. When the cancerous thyroid body extends downwards to the root of the neck and cannot be dragged upwards, crico-tracheotomy is the only operation that can be performed. When, in consequence of the extent of the tumour, it is necessary, in order to reach the air-tube, to divide some portion of the diseased gland, this may be best done by the application of the thermo-cautery. The diseased structure can be divided with much less hemorrhage and with greater rapidity by the application of this agent than by the use of the knife. When the wall of the trachea has been involved in the disease, tracheotomy may be attended with indirect changes, in consequence of some free portion of the soft cancerous structure being drawn into the canula. The operation is indicated chiefly in those cases in which the respiratory disturbances have just commenced. It is very necessary to support the strength of the patient in cases of malignant struma. The obstruction to deglutition will necessitate the use of the œsophageal tube in feeding, and subsequently the use of clysters. A like danger to that attending the wearing of a tracheal canula may follow the passage of a long tube into the stomach, the wall of the œsophagus may be perforated, and portions of cancerous growth penetrate into the alimentary canal.

The amount of suppuration may be reduced by removing from time to time ulcerated and gangrenous portions of the cancerous growth. This may be done by the use of the knife or sharp spoon, or by applying the actual cautery, and the raw surface should then be submitted to the action of a strong solution of chloride of zinc. By such treatment, rapid breaking down of the tumour, and consequent profuse discharge, may be controlled to a considerable degree.—*London Med. Record*, Aug. 15, 1879.

#### *Excision of Pylorus.*

M. PÉAN, the well-known surgeon of St Louis Hospital, has recently performed an operation which has considerably occupied the minds of the medical world in Paris. The patient was a man suffering from cancer. He was, at the time of the operation, in the last stage of cachexia. He was unable to retain any food in his stomach, and having to rely almost entirely on nutritive enemata for sustenance, which, as usual, were found to be insufficient. He accordingly applied to M. Péan to take some operative measures to relieve him, or, if nothing could be done, he was decided, he said, to put an end to his life. M. Péan, rather reluctantly, agreed to comply with the entreaties of the patient and his relatives, and decided to attempt an operation. An incision, about ten centimetres in length, was made on the left side of the umbilicus and parallel to the linea alba. When the peritoneum was opened the stomach was found to be considerably dilated, extending downwards as far as the pubic arch. Its walls were greatly hypertrophied. The peritoneum did not seem to be affected in any great degree. The pyloric portion of the stomach was then gently drawn forwards, when it was found that the growth measured six centimetres transversely and four in a vertical direction. The whole of this mass was excised, as was also a portion of the epiploon, which was diseased. The two surfaces of section were then drawn in contact by means of catgut sutures. No liquid of any kind was allowed to enter the peritoneal cavity during the operation. The abdominal wound was closed in the ordinary manner. The operation lasted two hours and a half. For the first two days after the operation the patient was fed by the rectum, but on the third day some food was allowed to be introduced into the stomach. During the first three days the pulse remained alarmingly weak, consequently it was decided to perform transfusion. Fifty grammes of blood were introduced into the median cephalic vein on a first occasion, and subsequently eighty more were injected. Unfortunately his condition did not improve, and he died on the night of the fourth day. He had shown no signs of peritonitis during these four days. It is much to be regretted that it was not possible to obtain permission to perform a necropsy, as it would have been highly interesting to see what had become of the catgut sutures, and to know whether the intestinal wound showed any signs of uniting.—*Lancet*, June 7, 1879.

#### *Extirpation of a Floating Kidney.*

Dr. A. W. SMYTH, of New Orleans, records (*New Orleans Medical and Surgical Journal*, Aug. 1879) the following successful case of extirpation of the kidney:—

Mrs. H. A., aged 35, childless, of medium stature and delicate build, consulted Dr. Smyth in April, 1879, and gave the following history of her case:—

Eight years previously, she began to be afflicted with a pain in her right side. Shortly after the commencement of this pain, she discovered a tumour in her right side, to which she attributed her suffering. She tried various remedies for the relief of her pain, without any benefit. In 1873, Drs. Wilkinson and Callo-way, of Galveston, performed on her the usual operation for ovarian tumour,

without removing the cause of her trouble. The year following, her suffering still continuing, Dr. Greensville Dowell, believing that the pain was owing to the mobility of the tumour, passed a large curved needle with a tape-seton through the walls of the abdomen, and through the tumour, with the purpose of causing adhesion, so as to prevent the moving of the tumour in the abdomen. Some hæmaturia was noticed after this operation. The seton was retained for three months, and gave some relief. At the end of that time the tape broke and came away. The seton caused a persistent offensive discharge from the wound.

Six months afterwards, Drs. Calloway and Penny—Dr. Dowell being absent from Galveston—attempted twice to re-introduce the seton. But on both occasions, broke their needles, leaving the broken ends in the abdomen.

Two months later, Dr. Dowell introduced the seton ~~again, without giving~~ ~~any relief~~, pain as in the first instance.

From continual suffering after this, her mind gradually became impaired, and in June, 1875, she was taken to the State Lunatic Asylum, in Austin, Texas, where she remained for two years. During her confinement there, the second seton came away.

In November in 1878 she had recovered sufficiently to return home. She then went to New Orleans and applied for relief to the Charity Hospital, and her tumour was then diagnosticated as a floating kidney. In April, 1879, she was brought to Dr. Smyth to have the kidney removed, for which she was extremely anxious. The operation was performed on the 3d of June.

The operation was commenced by making an incision in the right side of the lumbar region, extending externally from the crest of the ilium to the edge of the eleventh rib, two and a half inches by measurement from the median line of the spine and parallel with it. Internally the incision extended to the edge of the twelfth rib. The muscles and the transversalis fascia having been divided, search was made for the kidney, which was found in the umbilical region. The kidney, by pressure upon the abdomen, was forced into its place, and while held there by an assistant, the fascia covering the kidney was ruptured by the finger, and the organ was extracted without difficulty. While still in the wound, a strong ligature was passed around the renal vessels and other connections, at a distance of less than an inch—perhaps, about a half an inch—from the hilus; and the organ was then detached. No elongation of the connections of the kidney was observable. Nothing worthy of special note—much less anything untoward—occurred during the operation. At its conclusion, two sutures were inserted, to bring the edges of the integuments together, in the upper part of the wound, the ligature being left hanging out of the lower part. The wound was dressed with a solution of carbolic acid, of the strength of one drachm to a pint of water. A hypodermic injection of half a grain of sulphate of morphia was administered, and repeated at bedtime.

On the day following there was slight febrile disturbance, which increased on the third day, when the temperature reached 103° F., and the pulse 100. On the fourth day the temperature was 102° F., and the pulse 80. On the fifth day the temperature was normal, and the pulse 70. Very free suppuration occurred from this time to the tenth day, when the ligature came away. On the eleventh day, the patient got up and walked about without pain. She complained of little or no suffering after the operation; and objected to the use of the hypodermic injection on account of the pain it gave her, after the fourth day. No medicine, whatever, of any kind—not a dose of anything—was given to the patient, either before or after the operation; the only treatment used being four hypodermic injections, of half a grain each, of sulphate of morphia.

The kidney removed was found to be of normal size, but to be scarred with a

deep cicatrix, extending, from the inferior and outer edge, obliquely up, and out, and apparently through the pelvis. The length of the cicatrix was about two inches and a half. It was evidently the result of the seton introduced, which had cut its way completely out of the organ.

The operation has been followed by complete recovery; and the patient no longer complains of the trouble afflicting her, on account of which it was undertaken.

It may be worthy of special note that in this case of Dr. Smyth, the operation was performed through the lumbar region, that it was found not difficult of performance, and that it was not followed by any apparent dangers or risks.

[This makes the eighteenth case which we have from time to time recorded in ~~this volume~~ of 50 per cent.]

*On an Operation for the Relief of Patients who Suffer Severely from Long-standing Hypertrophy of one Prostate, or from Vesical Tumour, with Retained Urine.*

SIR HENRY THOMPSON, in communication to the Royal Medical and Chirurgical Society (*British Medical Journal*, June 7, 1879), asked whether, when a patient had long ceased to pass urine by his own efforts, and had to pass the catheter with great frequency and often with pain and difficulty, it might not be desirable to place a tube *en permanence* in the bladder, making an opening above the pubis for the purpose. This might be done safely and simply, since there was a route into the bladder, by means of a staff, as in the high operation for stone. But as, in these cases, the bladder was usually small and contracted, it was to be opened rather *behind* than *above* the symphysis pubis, so as to make certain of *not injuring the peritoneum*. This might be done without difficulty by following the instructions laid down. In performing the operation, a curved hollow sound was used, having a stylet with a bulbous end. The sound being introduced into the bladder, the point was made to project against the wall of the organ just behind the symphysis. A small incision being then made, the end of the staff was sought with the finger, and the bladder carefully perforated; care being taken not to make the incision too large, so as to avoid the escape of urine by the side of the tube to be introduced. A gum-elastic tube, having a shield like that of a tracheotomy-tube, was then passed into the end of the sound (the stylet having been withdrawn), and thus introduced into the bladder. Some care was subsequently required to keep the tube clean; but the relief produced was great. The author had applied the proceeding only in very extreme circumstances, with the view—in which he had succeeded—of rendering the short remains of a closing life tolerable—viz., in three cases for hypertrophied prostate, in one for cancer, and in one for villous tumour. He proposed the question—May it not be desirable to adopt such a procedure in some instances at a somewhat earlier period in the history of such cases?

Dr. KEYES, of New York, had had under his care a case which he had treated in a manner similar to that described by Sir Henry Thompson. The patient was a gentleman aged 60, who for some time had been the subject of prostatic obstruction, the effects of which at last became much aggravated. Dr. Keyes made an opening above the pubes, and introduced a double tube about three inches and a half or four inches long, having a plate like that of a tracheotomy-tube. The patient wore the tube, with much relief, during more than nine months, and at last died of some other disorder. The shield of the tube was fitted with a universal joint, which was very useful in enabling the patient to wear it with comfort.

Mr. TEEVAN said that Sir H. Thompson's paper was very valuable in directing



the surgeon's attention to what could be done for the relief of obstruction. A man who was obliged to use a catheter was as certainly condemned to die as if he had cancer; it was only a question of time. As age advanced, he became less capable of using the instrument, and perhaps made a false passage; and possibly a course of management would be followed which would lead to cystitis. Was it not justifiable in certain cases to endeavour to remove the cause of the complaint? Removal of prostatic tumours had been done, and was really not a dangerous operation. An incision in the middle line of the perineum or through the rectum was preferable to the incision as for lateral lithotomy.

Sir HENRY THOMPSON said that it was very rare to find a polypoid pedunculated prostatic growth that could be removed by operation. The enlarged prostate was generally a rounded or shapeless mass, incapable of removal. ~~It was not aware of any operation for the removal of polypoid growths, though they had been removed during lithotomy.~~ It often happened that portions of the prostate were shelled out and removed in the lithotomy forceps. He did not think that the condition of persons who were obliged to use the catheter was so gloomy as Mr. Teevan represented. He knew a gentleman who died at the age of ninety, after having used a catheter twenty-two years; and another gentleman at Norwich told him that he had used the catheter thirty-five thousand times. In the researches which he made some years ago, in conjunction with Dr. Messent, on the old men in Greenwich Hospital, they found the average age at death to be 73; while that of those who used the catheter was 72½ years. He protested against causing men who used the catheter to believe that life was thereby shortened. With regard to the removal of tumours from the bladder, it was necessary to bear in mind Mrs. Glasse's precept. "First catch your hare," and to be sure that there was a tumour. There was no novelty in his operation, except that he performed it when retention was not actually present, and retained the tube.

#### *Lithotrixy at a Single Sitting.*

Sir HENRY THOMPSON has recently placed on record (*British Med. Journal*, Aug. 2, 1879), his experience of the method of removing calculus from the bladder at a single sitting, as first advocated in the columns of the *American Journal of the Medical Sciences*, by Dr. Henry J. Bigelow, of Boston.

In all his cases Sir Henry used his own lithotrites with the cylindrical handle; but he has also employed for the latter three cases a more powerful instrument, although but very little exceeding in size those he has hitherto employed. This has been applied chiefly during the first part of the procedure; viz., that of breaking the stone into large fragments. The difference in this new lithotrite consists in making the lower part of the male blade keel-shaped, or like the prow of a ship, while the upper part is still flattened; so that the instrument may execute powerful cutting and crushing actions simultaneously. The male blade is also placed at right angles with the shaft, and thus acts at great advantage in comparison with a blade diagonally placed. At the same time, the female blade retains its curve, enabling the instrument to be introduced with as much facility as heretofore. Lastly, he thickened the sides of the latter, and enlarged the opening to admit the prow of the male blade to enter it and drive out any *débris* which—with the increased amount of work now required—might otherwise lodge and impact the blades. In all his cases Sir Henry employed his improved aspirator.

Sir Henry's cases are thirteen in number, and all were successful. The mortality was *nil*. He considers the result encouraging. "There is one observation I may make," he says, "and it is this: When the great bulk of a calculus of considerable size has been removed, say in fifteen or twenty-five minutes, or thereabout, and it is quite obvious that a small piece or two only remain, I would

advise that, if another effort or two to remove these last be unsuccessful, it is better not to repeat fruitless manipulations, but to give over the search to a future attempt. As far as my brief experience above given enables me to judge, it is wise, I think, to leave, as I did in three or four cases, a fragment or two, which seemed unwilling to be caught, until a day or two later, when they may be found in a tranquil bladder without difficulty, and meantime had clearly done no harm.

“Lastly, there is a fact about which I have now no manner of doubt; viz., that large and clumsy lithotrites are unnecessary for our purpose; and that the instruments which I have described above are more efficient, safe, and speedy in their action than the large and unwieldy lithotrites which have been proposed.”

### *Disease of the Bladder.*

Dr. ROBERT S. HUDSON reports (*Dublin Journ.* 1879) an extremely interesting case of this rare affection in which the disease lasted for upwards of eleven years. When it first appeared the patient was treated with injections of a solution of nitrate of silver at intervals for several weeks, and he was apparently completely cured for eight years, when his old symptoms reappeared, and he consulted Dr. Hudson. Three years later he died, and at the autopsy there were found eight tumours, each connected by a narrow pedicle, which might have been ligatured, avulsed, or treated with the *écraseur*.

From a careful study of the case and of the literature of the disease Dr. Hudson offers the following conclusions:—

1. Villous disease of the bladder is not so rare as is generally supposed—many so-called cases of chronic cystitis being probably due to it.
2. Its diagnosis is most difficult, and can only be arrived at after long observation, and by a process of exclusion.
3. Urinary deposits containing so-called cancer cells are very misleading, but the microscope is most valuable in detecting small portions of genuine villous growth.
4. There should be no difficulty in detecting the growths in the female, as the whole internal surface of the female bladder can be readily explored with the finger after rapid dilatation of the urethra, when under the influence of an anæsthetic.
5. Astringent injections are likely to be of use in the early stages, and before the growths have become pedunculated.
6. The surgeon, while unsparing in the use of sedatives to relieve pain and spasm, should bear in mind the possibility of permanent cure by removal of the growth.
7. Statistics show that the operation is neither difficult nor dangerous in the female; and there are good grounds for believing that when preceded by cystotomy in the adult male it will prove justifiable and satisfactory.

### *Lymphadenoma of the Testis.*

PROFS. MOXON and TERRILLON terminate a paper in the *Archives Générales* for July with the following conclusions:—1. Lymphadenoma or tumor constituted by a tissue of new formation comparable to that of lymphatic glands may be developed in the testis. 2. It constitutes a variety of varicocele which is quite distinct in an anatomical point of view, the diagnosis of which, in the living, is not impossible. 3. It seems to affect the gland itself by preference, sparing the epididymis. 4. From the commencement the gland is attacked throughout its whole extent. The degeneration seems to commence in the intra-tubular cellular tissue, and invades secondarily the walls of the seminiferous tubes, which dis-

appear themselves in proportion as the neoplastic tissue extends. 5. The lymphadenoma may occupy both testes simultaneously—a fact that appears special to this variety of neoplasm of the testis. 6. Generalization takes place early and rapidly. Of frequent occurrence in the viscera and the bones, it may also involve cutaneous and subcutaneous tissue situated at a great distance from the primary seat of the disease. This and the preceding characteristic may prove of great utility in the diagnosis of the disease. 7. This infection of the economy may, during a relatively long period, not give rise to any appreciable cachexia. 8. This lymphadenoma does not appear to be accompanied by leukæmia. 9. Prognosis is fatal, and surgical intervention up to the present time has always proved useless.—*Med. Times and Gaz.*, Aug. 9, 1879.

#### *Etiology of Hip-Joint Disease.*

In a communication to the *Lancet* (Aug. 2, 1879) Mr. RICHARD BARWELL, Surgeon to Charing-Cross Hospital, London, calls attention to the connection between phimosis and hip-joint disease. A good many years ago I was struck, he says, with the fact that nearly all the boys we admitted for hip disease into Charing-Cross Hospital had congenital phimosis. In a short time this coincidence was found to be nearly, if not quite, constant. At last, in the middle of 1873, I determined to note, in a hundred male cases of hip disease occurring in my private practice, or admitted into hospital, the presence or absence of this condition. For the sake of better classification phimosis was divided into three classes: 1st degree, the opening in the prepuce a mere pinhole, so that on retraction no part of the glans, or only a minute portion of the urethral lips, could be seen. 2d degree, in which a considerable part of, or all but nothing beyond, the urethral orifice could be uncovered. 3d degree, in which the prepuce, when retracted, uncovered some portion, but only a portion, of the glans. 4th degree, elongated prepuce projecting more than a quarter of an inch beyond the glans, but capable of entire retraction. 5th degree, normal.

*Table of 100 Cases of Hip Disease in Male Children under Ten Years of age.*

1st degree.	2d degree.	3d degree.	Elongation.	Normal.
39	27	17	11	6

#### *The same divided into ages.*

Years.	1st degree	2d degree.	3d degree.	Elongation.	Normal.
2 to 4	3	2	0	1	1
4 to 6	7	5	2	3	3
6 to 8	16	11	9	4	1
8 to 10	13	9	6	3	1

The first line of this table is very significant when it is considered that the cases are not picked or chosen, but represent every hip disease in the male that came under my notice,<sup>1</sup> from the end of 1873 up to the middle of 1878, when my number was complete. It will be observed that of these cases 83 have phimosis, that only 6 have normally formed prepuce, and that from complete, or the first degree of phimosis, to which class more than one-third of the cases belong, the number steadily declines to the normal. I would also point out that these are not fortuitous coincidences, because for two years at least before commencing tabulation this association was remarked. Furthermore, I asked my friend, Mr. Marrant Baker, to inquire for me about the prevalence of hip disease at the Eve-

<sup>1</sup> My colleagues at the hospital had kindly permitted me to make use also of their cases for statistical purposes.

lina Hospital, which is largely used by Jews. He tells me that few children are there admitted for hip disease, and that most of those so received belong, not to the Jewish, but to the Christian community. I have appended also the second part of the table—that which divides the cases into ages—although I think in certain ways the division is not very reliable; for finding it impossible to ascertain from the accounts given by parents the exact period of commencement, the age at which I saw the child or admitted him into hospital has been recorded. Children of course came under my notice in all stages of the disease; hence the table shows nothing as to the time at which the malady commenced.

The important fact, however, is simply coincidence of phimosis and hip disease—a coincidence which I should never have dreamed of or imagined had it not been forced upon me. Upon the mode in which the one influences the other I would rather not speculate further than to ~~say that the condition of the penis in children has facile, frequent, and often long-continued priapism; that this condition, unnatural in the infant, must produce after a time a certain irritability or irritation of the lumbar spinal cord; that from this part the various nerves of the pelvis and lower limb are given off; that the influence of spinal irritation on the trophic nerves is well known, and that just at this particular period large trophic changes are in progress about the hip-joint.~~

Of course, I have not overlooked the fact that hip disease also occurs in female children, though I believe less frequently than in the male.<sup>1</sup> I regret exceedingly that I did not simultaneously tabulate such cases, as I am now engaged in doing; but this I can say with certainty, that in a large proportion of girls afflicted with hip disease will be found vulvitis, even vaginitis with or without discharge, and generally, I believe, produced in the first instance by thread-worms creeping from the rectum to the vagina. In a certain proportion will be found protruding nymphæ or nymphæ covered by a cuticular surface. Further than this, as my numbers are incomplete, I am disinclined to go. The inference as to treatment of male cases in the earlier stages is obvious.

#### *The Disturbance in the Growth of the Long Bones after Necrosis of the Diaphysis.*

In this paper Prof. HELFERICH gives (*Deutsch Zeit. f. Chir.*, Bd. x.) careful measurements of the affected region in 141 instances in which necrosis had attacked some part of one of the long bones. He shows that the relation between liability to disease and the rate of growth in a bone, and also in the upper and lower ends of a bone, has been already noted by other observers, and on the whole is correct. The chief exception is the tibia, which is more liable to necrosis than the femur, though its rate of growth is less. This is explained by the greater liability of the tibia to injury, which also causes its shaft to be more frequently affected than that of other bones. With this exception, necrosis is most frequent near the ends of the diaphyses, and in each case near that end at which the growth is the greater.

The numerous careful measurements which the author has made show that interference with the growth of the part affected is frequent, and he suggests that it is often overlooked in consequence of its being, in some instances, slight, and in others masked by a compensatory greater natural growth in the bone or bones of another segment of the limb. In the femur he found 13 instances of shortening to 3 of lengthening; in the tibia, 12 of shortening to 14 of lengthening; in the humerus, 4 of shortening to 1 of lengthening; in the radius, 2 of shortening. These interferences with the length do not take place after the growth of the bone has ceased and after the epiphyses are ankylosed to the shafts. They

<sup>1</sup> During the time that I was noting 100 male cases I saw only 73 female cases.

depend upon some influences exerted on the epiphysial cartilages by the disease. The lengthening is due to the prolonged hyperæmia attendant upon necrosis extending to the epiphysial cartilage, and giving an impetus to the cell formation there; and it is most frequent in the tibia, because the necrosis in that bone frequently affects the shaft; whereas in other bones the disease, in consequence of its being nearer to epiphysial cartilage, is more likely to cause destruction of the cartilage and consequent arrest of growth. Examples are quoted in which disease of the epiphyses, occurring in affections of joints, was attended with elongation of the bones, but that is rare in comparison with shortening from this cause. He alludes to the possibility of necrosis causing impairment and destruction of the nearest epiphysial cartilage and arrest of growth at that, the proximal, end, and merely inducing hyperæmia and increase of growth at the more distal end, and these diminution and increase of growth in the same bone, and produced by the same disease, affecting the two ends in an unequal degree.

The lengthening of the adjacent bones, which, though rare, may be associated either with lengthening or shortening of the diseased bone, is in either case to be attributed to the accession of blood-supply to the limb, which is in some way brought about by the disease, and like the similar change in diseased bone, it must be limited to the growing period of life.

The associated shortening of the adjacent bones may be attributed, as indeed may sometimes in part be that of the diseased bone, to inactivity of the limb. It is most frequently observed when the disease is in the proximity of a joint, the use of the limb being in such cases interfered with most.

The associated elongation of the adjacent bone, as in the case of the fibula when the tibia is elongated, may depend upon the accession of blood extending to the fibula, or, upon tension exerted upon it by the growing tibia, or by both causes. The resistance of the fibula may, however, limit the elongation of the tibia, or may cause it to assume a curve, as has been observed by Paget and Stanley. In some instances, however, the fibula has not been thus elongated, but has undergone luxation from the upper part of the tibia, its lower end remaining fixed to the tibia, and the upper end being drawn away from it. Two cases of shortening of the tibia were observed by Humphry, in one of which the upper end of the fibula was luxated, and projected above its articular surface in the tibia, and in the other the lower end projected downwards and touched the ground. Other deformities resulting from the unequal length of the two bones of one segment of the limb are mentioned.—*London Med. Record*, July 15, 1879.

*Reproduction of the Tibia after Osteomyelitis.*

At a recent meeting of the Gesellschaft der Aerzte in Vienna (*Allg. Wien. Med. Zeit.*, No. 24, 1879), Professor WEINLECHNER presented a lad, aged 17, who in October last had been taken ill with a severe inflammation of the left leg, from the knee downwards. When admitted into the hospital he was in a very precarious condition, a complication with pneumonia had set in, the temperature was permanently high, and he was much reduced in strength by the constant suppuration. When the patient had recovered from the pneumonia, Weinlechner proposed amputation of the leg, as osteomyelitis had manifestly set in; however, as this was objected to, Weinlechner removed the whole diaphysis of the tibia, which had in the mean time become necrotic. The extremity did not present a very sightly appearance after this operation, as the soft parts of the leg hung loosely about the remaining bone. The suppuration, however, decreased rapidly, and three weeks later the whole empty space was filled by osseous neoformation, which had developed within that short time. Five months have elapsed since,

during which time the wound had been healing. It is now completely cicatrized, with the exception of two very small fistulas. The newly-formed tibia is about three centimetres wide in its lower part, it is slightly abducted and not yet quite consolidated, as there is a pseudarthrosis about nine centimetres above the internal malleolus. The knee-joint is movable, and the leg can be stretched out and bent without any difficulty, but suppuration has evidently taken place in the ankle-joint, as the leg is stiff and immovable in that region.—*Lond. Med. Record*, Aug. 15, 1879.

#### *Fracture of the Coracoid Process.*

Dr. EDWARD C. HUSE, of Rockford, Ill., records (*Chicago Med. Journal*, August, 1879) the case of a physician who consulted him on account of an injury to his shoulder which he had sustained an hour before. ~~The patient~~ He stumbled and fell, striking his shoulder against the edge of a door standing ajar. The pain was so excessive as to render him unconscious for some little time. Upon careful examination of the parts, Dr. Huse was unable to detect any evidence of injury to the bony parts. There was inability to place the hand upon the head, and extreme tenderness on pressure over a limited space just inside the acromial end of the clavicle and just below it. No crepitus or deformity was at this time observable. Next morning there was circumscribed tumescence, with considerable impairment of function, corresponding to the action of the pectoralis minor and coraco-brachial muscles. It will be remembered that the former is inserted into this process, and also that the conjoined tendon of the latter and of the short head of the biceps arise from its outer border. Crepitation was now quite perceptible. This was doubtless more from rupture of the trapezoid ligament than the separation of the fragments of bone. Indeed, when the relations of this ligament and also of the conoid are considered, it seems that this fracture implies the necessary rupture of both of them.

When we observe that the coracoid process is epiphyseal, and that complete osseous union does not occur till the twenty-fifth year or even later, this case may be viewed more as a separation than a fracture, perhaps. Hamilton, however, considers such separations under the nomenclature of fractures.

The exceeding infrequency of this injury is obvious from a consideration of the anatomical reasons. Nothing but direct violence of a special kind can cause it. Erichsen says only about a dozen cases of fractured coracoid are recorded. Mr. Lizars denies having seen a well authenticated case. Bransby Cooper and Dr. R. Mussey have each seen one. Hamilton has seen but one.

The patient has but little inconvenience at present, no treatment further than elevation of the forearm upon the chest having been employed.

## OPHTHALMOLOGY AND OTOTOLOGY.

### *Ophthalmic Migraine.*

Dr. GALEZOWSKI contributed to the June number of the *Archives Générales de Médecine* a paper on ophthalmic migraine, or, to use his own definition, "migraine which localizes itself in the organ of sight." Many authors—English, French, and Italian—have mentioned the occurrence of ocular phenomena as occasional accompaniments of ordinary migraine, but Dr. Galezowski considers that in a certain number of cases these ocular phenomena constitute the whole

symptomatology of the morbid state, and appear to depend on a special localization of the neurosis in question.

He has observed, hitherto, only four varieties of ophthalmic migraine—1, periodic hemiopia; 2, glittering scotoma; 3, amaurosis; 4, photophobia. Each of these varieties usually presents, in addition to the symptom from which it takes its name, either some more or less marked symptoms of ordinary migraine, or else symptoms peculiar to ophthalmic migraine.

There are, however, some cases in which there exists but one single symptom, without anything else whatever to suggest that the case is one of migraine. For instance, when a periodic hemiopia, or a central periodic scotoma persists, as it may do, for some time, the diagnosis becomes very difficult, and it is impossible to speak confidently as to the nature of the disease without a most attentive examination of the patient's history and the general state of the patient's health.

It will often be found in these cases that the ocular phenomena have been preceded by, and have apparently taken the place of, frequent attacks of ordinary migraine. When the periodic hemiopia or scotoma is frequently repeated, the case becomes disquieting, for all work requiring steady application becomes impossible. A great variety of circumstances may add to the difficulty of the diagnosis in cases of ophthalmic migraine, such as the following: 1. The patient had, not long before the eye-symptoms came on, received a blow on the head. 2. One eye may be reduced to a stump, or the patient may be suffering from general staphyloma. 3. The attack may be complicated by the almost simultaneous occurrence of hysterical amblyopia, and this, Dr. Galezowski says, is not very uncommon. Dr. Bonnal, of Nice, relates the case of a man aged 40, who had been subject since he was 13 years old to periodical attacks (every three or four months) of strabismus and dimness of sight, accompanied by epileptiform symptoms without loss of consciousness. These attacks diminished very much in frequency and violence after he had taken service in the Hammam at Nice as a rubber.—*London Med. Record*, Aug. 15, 1879.

#### *Reflex Action in the Organ of Hearing.*

Dr. WEIL (*Monatschrift f. Ohren.*, June, 1878) finds that temporary relief from tinnitus may frequently be obtained by blowing in puffs through a simple tube or a Siegle's speculum on to the walls of the meatus. Many patients thus obtain partial or complete relief from the noise for a quarter or half an hour. In some cases the noises were increased by this proceeding, usually in persons complaining of ringing and whistling sounds. In those suffering from a dull noise, a good result was rarely absent; but, if the blowing was too prolonged or too forcible, the noise sometimes changed to a high clear tone. In some individuals no reaction was obtained. As the author thought of reflex contraction of the blood-vessels, he endeavoured to make the effects permanent by means of injections of ergotine, but without definite result.—*London Med. Record*, Aug. 15, 1879.

### MIDWIFERY AND GYNÆCOLOGY.

#### *Action of Pilocarpine on Uterine Contractions.*

In August, 1877, Dr. Massman, of St. Petersburg, was led to employ pilocarpine in a dropsical pregnant woman, on account of its diaphoretic properties. She was prematurely confined after the use of the drug. He noticed the same occurrence in February, 1878, and he then published these two observations.

Since then a number of experiments have been made by different investigators, as Schanta, Felseinreich, Kleinwächter, Parisi, J. Clay, and others. In a thesis on the subject, Dr. MARTI has given an account of these different observations on pregnant women, and also of some experimental researches of his own on animals carrying young. The conclusions he has arrived at are:—

1. That subcutaneous injections of pilocarpine in pregnant females and during labour have had no result, and have in no way brought on uterine contractions.

2. That the same has been the case in a large number of experiments on animals.

3. That in certain conditions of the uterus, as when the female or the animal under observation is already in labour, or has come to full time, subcutaneous injections of pilocarpine ~~are~~ <sup>are</sup> apparently to set up uterine contractions.

4. That in this last class of cases the uterine contractions appear some minutes after the injections, increase in frequency for some time, then become stationary, and then quickly cease. In some of these cases the contractions have not been strong enough to complete the labour.

5. From all the facts observed he concludes that, at full time or during labour, pilocarpine seems to have a special influence on the contractility of the uterus, but before the full time subcutaneous injections are almost always powerless to bring on premature labour.—*Glasgow Med. Journal*, August, 1879, from *Le Progrès Méd.*, May 10, 1879.

#### *Use of Benzoate of Soda in Puerperal Fever.*

LENNEBACH reports (*Allg. Med. Centr. Zeib.*, No. 55, 1879) four cases of puerperal fever which were cured by the use of benzoate of soda. Two of the patients were primiparae, the other two multiparae. In both cases of the primiparae, quinine was given in doses of one gramme, besides the benzoate of soda, as the temperature had risen to 105.8 degs. in the first day after the child's birth. It sank immediately to 100.4 degs. The patients took the quinine without any difficulty, and did not vomit it again, as had happened in one of the cases where it was given alone, without the benzoate of soda. The temperature remained normal. It appears that the author is not acquainted with the case reported by Professor Petersen of Kiel, where the life of a woman in puerperal fever was saved by large doses of quinine and benzoate of soda.—*London Med. Record*, Aug. 15, 1879.

#### *Laceration of the Cervix Uteri.*

Dr. SPIEGELBERG, who has had occasion to operate in ten cases of this affection, gives preference to Emmet's method. (*Bresl. Aerztl. Zeitschr.*, 1879; and *Centralblatt für die Med. Wissen.*, No. 18.) He thinks that chronic endometritis and a disturbance in the progress of involution of the uterus are often due to eversion of the os uteri and to laceration of the cervix; and that the latter often is the direct cause of endometritis of the neck, and the indirect cause of leucorrhœa and more serious affections of the mucous membrane of the cervix, so as to cause, under certain conditions, sterility and abortion, and perhaps even prove a great impediment to a successful treatment of retroflexion and retroversion of the womb. In some cases, a cure would be effected by healing the lacerations; while in other cases the patient recovered by being kept very quiet and treated antiphlogistically. He does not agree with Emmet in insisting on a preliminary treatment of the affections in every case; he thinks that this is only indicated in cases where the mucous membrane has undergone intense follicular changes. The operation must be performed with antiseptic precautions; but



there is hardly any need for anæsthetics. The patient is laid on her back, if the uterus can be easily drawn down; if not, she must be placed either on the right or the left side, according to the lacerations. Spiegelberg uses metal wire. The wire is generally removed on the tenth day, and the patient is allowed to leave her bed on the eighth day. Little must be done in the way of treatment, except keeping her quiet. Out of the author's ten cases, the wound healed by first intention in six; in three, by second intention; and in one case, one side did not heal at all.—*British Med. Journal*, July 12, 1879.

#### *Treatment of Uterine Fibroids by Ergot.*

Dr. G. ERNEST HERMAN, Assistant Obstetric Physician to the London Hospital, in a paper read before the ~~Hunterian Society~~ (*Med. Times and Gaz.*, Aug. 20, 1879), ~~con-~~ discusses this subject and offers the three following propositions as being warranted by the facts before the profession.

1. That ergot will often produce the diminution in size, and sometimes even complete absorption, of fibroid tumours of the uterus, and will, in the majority of cases relieve their symptoms.
2. That these effects will often follow the administration of the drug by the mouth, but will more certainly be produced by its hypodermic injection in the neighbourhood of the tumour.
3. That in all cases in which treatment is required, except those in which surgical interference is needed to avert immediate danger to life, this treatment should be tried before resorting to operative measures.

#### *Oöphorectomy in a case of Congenital Vaginal Defect.*

At the eighth Congress of German Surgeons, held in Berlin last April, Prof. VON LANGENBECK (*Wiener Medizin. Wochenschrift*) exhibited a woman, aged 23, on whom he had performed Battey's operation. She had been married three years. The catamenia commenced at the age of 14; and, as was afterwards discovered, the discharge took place *per urethram*, the vagina being entirely absent. The discharge was scanty, but was always attended with severe pain. Coitus was also effected by the urethra. As the menstrual troubles had lately increased to such an extent as to produce epileptiform attacks, Dr. von Langenbeck decided on extirpating the right ovary by Battey's method. He had ascertained by careful examination that the left ovary was wanting, and that the uterus was rudimentary. An incision about two inches long was made in the flank; the pedicle of the ovary was tied with catgut, and sewn to the abdominal wound. The process of healing was uninterrupted; the ligatured remains of the pedicle fell off on the fourteenth day. Menstruation took place on the fifth day after the operation, although one ovary was removed, and the absence of the other had been ascertained both before and during the operation. Dr. von Langenbeck expressed his satisfaction with the result obtained, and recommended the proceeding for adoption in similar cases.—*British Med. Journal*, July 12, 1879.

#### *The Treatment of the Pedicle in Ovariectomy.*

Professor SPIEGELBERG reports (*Berliner Klinische Wochenschrift*, May 5, 1879) the result of thirty-five hospital cases of ovariectomy performed according to Lister's antiseptic method in its fullest extent, with special reference to the question as to what treatment of the pedicle is most suitably combined with the antiseptic method. Of these thirty-five cases, only 5, or 14 per cent., died; whereas in forty-five operations previously performed by him without the carbolic spray, twenty patients, or 45 per cent., died. The present series of cases Spiegelberg brings forward to show that it is possible, in conjunction with the antiseptic

method, to adopt the extra-peritoneal method of treating the pedicle with at least as great success as if it were ligatured and returned. Of the two methods he is inclined to prefer the treatment by clamp. Of nineteen cases treated with the clamp, eighteen recovered; while, of sixteen in whom the pedicle was ligatured and dropped, four died. In the latter, however, were included the most difficult cases. The author admits some degree of force in certain objections to the use of the clamp, namely, the frequent occurrence of suppuration in the lower angle of the wound, the slower healing of the wound, and the formation of a broader and less firm cicatrix at its lower angle. He does not consider, however, that, with due care, there is any danger of the pedicle slipping back into the abdominal cavity, or of septic material finding access to the raw end of the pedicle; and he has not found in ~~his experience~~ deleterious after-effects, either with regard to menstruation or pregnancy, from the adhesion of the ~~peritoneal wall~~ ~~to the pedicle~~ wall. His great objection to the intra-peritoneal mode of treating the pedicle is that pelvic suppuration later on, set up by the presence of the ligatures, is by no means very rare in patients thus treated. He therefore concludes that the future of patients with a clamped pedicle is a safer one than that of those in whom the pedicle has been ligatured and returned.—*Obstet. Journ. of Gt. Britain*, Aug. 1879.

In an article in the *Finska Läkarasällskapets Handlingar*, Band xix., Dr. F. SALTZMAN relates the histories of seven cases of ovariectomy recently performed by him, and makes some remarks on questions bearing on the operation. In six of the cases, as in all the similar operations previously described by him, he used the actual cautery in the treatment of the pedicle. The most important objection against this method, namely, that it does not afford a sure protection against secondary hemorrhage, may, in his opinion, be obviated by taking the precaution to tie each vessel in the pedicle with catgut. If it be desired to again ligature the pedicle, he regards catgut as the most suitable material. From his own observations and from those of others, the author has come to the conclusion that the fear lest the catgut ligature should fail to afford security against secondary hemorrhage, in consequence of its ready absorption, has been exaggerated. The author points out some inconveniences of the extraperitoneal method of management of the pedicle, among which he especially directs attention to the occurrence of tetanus in some of the cases treated in this way, and sums up by declaring his preference for the intraperitoneal method. This method is applicable in all cases, and the only important point is the choice between the ligature and the actual cautery. He decidedly prefers the cautery when one has to deal with a thick pedicle, especially when no large arteries can be detected in it. The ligature is indicated, in the first place, when the pedicle is comparatively thin, and contains arteries of large calibre; and it is absolutely required in cases where the pedicle is so short that the cautery-clamp cannot be applied, and where the tumour cannot be shelled out so as to form a pedicle. With regard to the use of the drainage-tube, especially in Douglas's pouch, Dr. Saltzman regards it as applicable only in some very rare exceptional cases. Of his seven operations, two were followed by death. He gives reasons for the use of antiseptics in the operation.—*British Med. Journal*, July 12, 1879, from *Nordiskt Med. Arkiv*, Bd. xi.

## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

### *Antidotes for Strychnia.*

Dr. HUSEMANN has confirmed (*Arch. f. exp. Path.*, x. p. 101) the experiments of Amagat that in cases of poisoning by small doses of strychnia, the

treatment with alcohol is to be preferred to the treatment by chloral. The reason for this is, that the quantity of alcohol required to neutralize the small but fatal dose of strychnia is not dangerous to life, although such may be the case from the amount of chloral administered. In investigations upon rabbits, absolute alcohol mixed with an equal portion of water to prevent the local coagulation of albumen, was found to cause death when administered in doses which are described by Amagat as innocuous. He thus shows the great difference in the susceptibility to alcohol which is found alike in rabbits and in man. It is therefore a matter of greater difficulty to define the exact dose of alcohol than of chloral which is necessary in a case of strychnia intoxication. As a result of his experiments, in which the author has only occasionally counteracted  $1\frac{1}{2}$  times the deadly dose of strychnia by the treatment with alcohol ~~it is necessary that no more alcohol should be used~~ it is necessary to counteract the minimal lethal dose of strychnia. Chloral is a still more certain remedy in cases of strychnia poisoning, even when the amount taken has been five or six times the deadly dose, whilst alcohol is unavailing if but two or three times the minimal lethal dose has been taken. The author has also found that a rabbit recovered from a single deadly dose of strychnia when it had been rendered insensible with physostigma. After larger doses of strychnia, however, the reflex irritability of the animal experimented upon was scarcely lessened by the physostigma, so that the antidotal effect of this drug is less than that of alcohol. Dr. Husemann therefore holds that physostigma is entirely useless as an antidote for strychnia poisoning, and he considers that the treatment with chloral is as yet the best method for any who are suffering from the effects of poisoning by strychnia.—*Practitioner*, Sept. 1879.

#### *Treatment of Strychnia Poisoning.*

RIVINE (*Centralblatt f. die Med. Wiss.*, Jan. 25, 1879), in a case of strychnia poisoning in a girl of 16, has found that 40 grains of potassium bromide, and 10.20 grains of chloral hydrate were of great use, whilst 120 grains of potassium bromide or 40 grains of hydrate of chloral are necessary by themselves. He therefore recommends the combination of the two remedies in the treatment of cases of poisoning by strychnia. To test this theory, his pupil, Hessler, has carried out certain experiments on rabbits. For this purpose Hessler has investigated the mode of action of potassium bromide on the sleep produced by chloral hydrate. He finds that the simultaneous administration of the former drug does not appreciably prolong this sleep. That sensation and reflex irritability are never completely abolished. That the danger of a fatal termination would not be diminished in narcosis produced by the administration of four-fifths of the minimum lethal dose of chloral hydrate with the addition of potassium bromide in a small dose (about one-third of the lethal amount). In ten cases of the minimal lethal doses of strychnia the method advocated by Rivine was not of more use than the simple chloral treatment; by both methods the tetanus which threatened life was allayed, and consequently life was prolonged. The duration and intensity of the attack was lessened to the greatest extent when the chloral mixture was given. When the minimal lethal dose of chloral hydrate was not exceeded, a sudden diminution in the frequency of respiration and death from chloral poisoning occasionally occurred. The ultimate conclusion to which the experiments have led is that the simple treatment of acute strychnia poisoning by means of chloral hydrate is decidedly superior to the combined method proposed by Rivine.—*Practitioner*, June, 1879.

## AMERICAN INTELLIGENCE.

## ORIGINAL COMMUNICATIONS.

*Case of Gunshot Wound of the Heart; Death on the Thirteenth Day.*  
By H. W. BOONE, M.D., Resident Physician of the ~~City and County~~ Hospital, San Francisco, Cal.

CHARLES KLINE, æt. 36, a German farmer, was admitted to the City and County Hospital of San Francisco, at 1 P.M., June 2, 1879. He presented the appearance of a strong, hearty, and well-nourished man. States that, twenty-four hours previously, he accidentally shot himself while practising with a pistol, carrying a ball of  $\frac{38}{100}$  calibre. He was taken to the City Receiving Hospital, and the ball was extracted from his back. Is very feeble and faint; can only speak in a whisper; pulse 112; respiration 22, breathing not laboured. On examination found a bullet wound at lower border of fifth rib, under left nipple, and on the back an incision where the bullet was extracted in a line horizontal with its point of entrance, and near the spinal column. He occasionally expectorates a few drops of blood, mixed with mucus, but has not had any hemorrhage of greater amount. The patient was kept perfectly quiet; the heart's action was controlled by the use of appropriate remedies, and his strength supported by nourishing diet. He remained in the same condition until June 14, when, at 1.15 P. M., he spat up about two fluidrachms of blood, and showed symptoms of collapse. In spite of all my efforts he sank rapidly, and died at 2 P. M. The body was removed by the coroner, and I was unable to obtain an autopsy until June 18, nearly four days after death.

*Autopsy.*—Upon dissecting back the coverings of the ribs, found that the ball had splintered a small piece of the lower edge of the fifth rib. On raising the ribs two and a half pints of blood were removed from the left pleural cavity, and the lung was found floating above the effusion. Owing to partial decomposition having taken place I was unable to find any wound in the lung. The lower portion of the left lung was congested; the upper part was normal. Right lung was healthy. There was no effusion in the pericardium; it was not adherent to the heart, and contained no effusion of lymph. The bullet had penetrated the pericardium anteriorly, passed through the muscular tissue of the wall of the left ventricle, one inch above its apex, and passed out of the pericardium posteriorly. The furrow in the wall of the ventricle was an inch and a half

long, and a quarter of an inch deep, and the edges of the wound were ragged and everted. The muscle appeared to be thickened by inflammatory action; there was no pus, and the appearances were those of an attempt at reparation. The left ventricle held water, and on examination with the finger it could be felt that the ball had not cut entirely through the wall into its cavity. The heart was large, and the aortic valves greatly congested, but normal in shape. The interior of all the cavities of the heart were natural in appearance, and there was no sign of any other lesion of its walls. Owing to the friable state of the left lung, no clear account can be given of its condition. ~~It seems probable that death~~  
~~resulted from a large hemorrhage from a large bloodvessel in the left lung.~~

The point of interest in this case is, that the heart and pericardium were extensively wounded by a large pistol bullet, and that the man lived with very little suffering for thirteen days. The condition of the heart at the autopsy seemed to indicate that reparative action had set in, and that death was due to a hemorrhage from an entirely different source.

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*Case of Fracture of the Third Cervical Vertebra.* By H. F. EBERMAN, M.D., of Lancaster, Pa.

A very singular and interesting case of fracture of the third cervical vertebra occurred in Lancaster, Pennsylvania, a few weeks ago.

The patient, William Barracks, aged about seventy years, was making his home in a stable adjoining a hotel, and was in the habit of sleeping in the hay-loft. One morning on arising and while descending the steps, he slipped and fell, striking his occiput violently on the ground, and thus forcibly throwing his head forward on his chest, and rendering him insensible for a considerable time.

After recovering from the shock, he arose and, placing both hands to his neck, walked to the bar-room of the hotel (which is half a square from the place of accident), where he remarked that he thought his neck was hurt, and at the same time called for a glass of whiskey, which he immediately drank. He then returned to the stable, lay down on the hay, and expired in about half an hour.

On the following day, a *post-mortem* examination was made by Dr. H. E. Muhlenberg and myself, with the following result.

The third cervical vertebra was found to be fractured transversely through the body, the arch on the right side was broken entirely through, the articulating surfaces on both sides were fractured through the middle, the transverse process on the right side of the atlas was broken off, and the inter-spinous and posterior vertebral ligaments were ruptured, but the spinal cord remained intact.

The specimen is in the possession of Dr. Muhlenberg.

May 4th, 1879.

## OBITUARY NOTICE.

A RECITAL of what Dr. GEORGE B. WOOD has done is a fitting tribute to his memory. We may follow him through his public life, to use the language of woodmen, by the blazes which he has made, almost yearly, along his path, from the obscurity of private life to the brightness of renown. That the career of one who has deservedly attracted and long held the respectful attention of the profession, both at home and abroad, should be noticed in this Journal is unquestionable.

Dr. Wood was born ~~in 1795 in Greenwich, one of the oldest settlements on the river Cohausey, in Cumberland County, New Jersey.~~ His parents belonged to the religious Society of Friends, were well-to-do farmers, and for some time kept a wholesale and retail store of miscellaneous goods. They and their ancestors, at the time of his birth, had owned and occupied the estate on which he was born a half century and upwards. They were always highly respected and influential in the community.

In 1815 Dr. Wood received the degree of Bachelor of Arts from the University of Pennsylvania, became a pupil of Dr. Joseph Parrish, a leading practitioner of the day, and in 1818 acquired the degree of Doctor of Medicine from the same institution. Dyspepsia was the subject of his inaugural essay.

When Dr. Wood entered the ranks of the profession, the leading medical minds of Philadelphia and of the country generally had become more than usually interested in measures of improvement. Although the ability and disposition of the professors to teach thoroughly was not doubted, it was believed that the medical teaching of the University, then the only chartered medical school in the city, was defective. The length of the medical session did not afford time enough to enable the professors to deliver complete courses. Lectures on some subjects were omitted every year. As a remedy for such defect, preceptors, in addition to the personal attention which had been usually given to their pupils, employed assistants to impart instruction on special branches; and not long afterwards associations were formed to supplement the teaching of the University, by courses of lectures delivered during the spring and summer. One of these was The Medical Institute of Philadelphia, founded by Dr. Nathaniel Chapman, and another, The Philadelphia Association for Medical Instruction, founded by Dr. Joseph Parrish, both including members of the medical faculty of the University.

In the cities practitioners had ceased almost entirely to supply medicines to their patients. The apothecaries generally were not systematically taught. Very few of them were skilful or scientific pharmacists. No standard of officinal preparations had been established for the common observance of apothecaries of all parts of the country. The strength of preparations was not uniformly the same in different localities, nor even in all shops of the same town. Under such a condition it may be taken for granted that practitioners were reluctant to confide their prescriptions to be dispensed by apothecaries indiscriminately, and that the necessity of establishing a national pharmacopœia was manifest.

It was fortunate for him in the end, perhaps, that when Dr. Wood entered the field, the satisfaction of his personal wants and desires was to be attained and measured by the profits of his own labour. Besides a liberal education, he possessed good health, firmness of purpose, energy, and marked capability of continuous work. It is probable that his first professional aspiration was to become a teacher. He had learned that adequate knowledge and training are essential to success in every vocation, and early acquired a habit of carefully arranging what-

ever he conceived might be necessary to the occasion of his action; nothing was left to chance. He lost no time. It is related that he first lectured on chemistry to young persons of both sexes; and after a short time was employed by his preceptor, Dr. Parrish, to deliver lectures on chemistry to his private pupils. Such was his early training for his brilliant professorial career.

August 1, 1821, Dr. Wood was appointed one of the attending physicians of the Pennsylvania Institution for the Deaf and Dumb. He discharged the duties of the office till Nov. 1844—twenty-three years—and from that time till his decease his name was on the list of the consulting physicians of the Institution.

The Philadelphia College of Pharmacy, with which Dr. Wood's early career is closely associated, owes its origin to a few public spirited and benevolent gentlemen, a majority of them members of the ~~Philadelphia Friends~~. Its foundation dates from Feb. 1821, when Dr. Gerard Troost was appointed professor of chemistry, and Dr. Samuel Jackson professor of materia medica. The purpose of the founders of the college was to increase and diffuse knowledge of pharmacy. So well has it answered expectation, that what was at that time merely a trade, has become a scientific profession which has the confidence and respect of the community. Its members generally are competent and trustworthy, and in this respect are not inferior to physicians as a class. Since its foundation this institution has conferred its degree of graduate in pharmacy on 1528 of its 5913 matriculants. July 23, 1822, Dr. Wood was elected professor of chemistry in place of Dr. Troost, resigned.

About this time his intimacy with Dr. Franklin Bache, who was then teaching chemistry, began. This friendship was confiding and lifelong. Dr. Bache was five years older than his friend; and it is most probable that his experience contributed to the success of enterprises in which they jointly engaged.

April 2, 1823, the young professor married Caroline, the only child of Mr. Peter Hahn. This act severed his rightful connection with the Society of Friends.

Feb. 14, 1824, he delivered, pursuant to appointment, an oration before the Philadelphia Medical Society, in which he said: "Few professions are more truly respectable than that of pharmacy; few require in their members more science, skill, and moral integrity; and, so long as he moves within the proper sphere of his duties, the apothecary may challenge our highest este

Nov. 16, 1824, he delivered an address to the members of the Philadelphia College of Pharmacy, the object of which was to excite attention to its importance, and rouse the zeal of the druggists and pharmacists of the city in its favour. Thirty-five years afterwards he wrote: "It has been among the highest gratifications of my life, that I was able to contribute towards the expansion and permanent success of a school which has been productive of much good, which is still in prosperous operation, and the establishment of which may be considered as the commencement of a new era in the pharmacy of the United States."

Dr. Wood perceived that the influence of scientific and other societies on the lives of their members is often beneficent. His opinion was that "a young man thus connected, if disposed to take advantage of his opportunities, will have much greater chances of distinction and usefulness than if isolated in his course of life."

Feb. 1825, he was elected a member of the Academy of Natural Sciences of Philadelphia; but during his life he never manifested interest in the pursuits of the society. April, 1827, he was elected a fellow of the College of Physicians, of Philadelphia; and Nov. 3, 1845, he was duly elected vice-president in competition with three other candidates, *vice* Dr. Henry Neill, deceased. On the death of Dr. Thomas T. Hewson, he was unanimously elected president of the

society March 7, 1848, and held the office until the close of his life—a period of thirty-one years.

As long as the condition of his health permitted, Dr. Wood actively participated in its proceedings, and performed all his duties in the society most acceptably, and gave liberally towards its progress in various ways. On condition that the library should be open daily, he annually contributed \$500 from June, 1866, and bequeathed \$10,000 to constitute a permanent fund for the perpetuation of this bounty, and directed besides that a mortgage of \$5000, which he held on the building, should be cancelled, and that all the medical books in his library, copies of which were not already in possession of the College, should be given to it.

Oct. 29, 1827, Dr. Wood read before the council of the Historical Society of Pennsylvania, a "~~History of the University of Pennsylvania~~," which was printed by the council.

Jan. 17, 1829, he was selected to be a member of the American Philosophical Society, and was elected president, Jan. 1859, and died in office. He bequeathed \$20,000 to the building-fund of the Society; and his "copy of the great work of Canova on the ancient buildings of Rome."

The *Journal of the Philadelphia College of Pharmacy* was started in 1825; four numbers were issued in the course of three years. March 31, 1829, Dr. Wood was appointed a member of the publication committee of the College, and served on it till 1844. The first number of a new series of the journal was issued in April, 1829. Since then it has been published regularly, and now appears monthly.

Jan. 1830, Dr. Wood was a member of the Philadelphia Association for Medical Instruction; he lectured on materia medica and the institutes of medicine, and continued till the association was dissolved in 1836.

In Jan. 1830, he was one of the delegates appointed by the College of Physicians of Philadelphia, to the National Convention for the revision of the Pharmacopœia of the United States. The convention met in Washington, D. C. Drs. Wood and Bache were appointed members of the committee of revision and publication.

The first Pharmacopœia of the United States was published in Boston in 1820, under authority of a convention composed of representatives of several incorporated medical institutions of the Union, including the College of Physicians of Philadelphia, which met in Washington in January. Dr. Franklin Bache published a review of the organic part of this work in the *American Medical Record* of 1821, vol. iv. p. 483, which is immediately followed in the same volume by an elaborate criticism of the organic part, which is ascribed to Dr. Wood.

Dr. Wood was elected vice-president of the National Convention, and chairman of the committee of revision and publication of the pharmacopœia, in 1840; president in 1850 and 1860, and member of the committee of revision and publication in 1870. Dr. Bache was associated with him in every revision of the pharmacopœia, except the last.

Sept. 28, 1830, Dr. Wood was elected a trustee of the Philadelphia College of Pharmacy. On his motion a committee was appointed, Oct. 26, 1830, to examine the newly prepared Pharmacopœia. It reported, Dec. 28, 1830, that it was in every respect improved, and recommended that the observance of its formulæ be enjoined on all members of the college. The work was published in Philadelphia, April, 1831, by John Grigg.

The *North American Medical and Surgical Journal* for Jan. 1831, contains a review ascribed to the pen of Dr. Wood, on "The Pharmacopœia of the United States of America, by authority of the General Convention held in 1830. Second edition from the first edition published in 1820, with additions and cor-



rections, New York, Nov. 1830." The reviewer condemns the plan and execution of the work, and shows that the national convention did not authorize or sanction its publication.

May 24, 1831, he was elected professor of materia medica in the Philadelphia College of Pharmacy, *vice* Dr. Benjamin Ellis, deceased, and was succeeded in the chair of chemistry by Dr. Franklin Bache.

Jan. 1833, *The Dispensatory of the United States of America* was published. This work was begun in Oct. 1830, in conjunction with Dr. Franklin Bache and Mr. Daniel B. Smith. The latter very soon withdrew. This Dispensatory is mainly an explanatory commentary on the Pharmacopœia of the United States. The first edition contains 1073 pages 8vo., and the fourteenth, published 1877, 1879 pages. It is estimated that 120,000 copies of the work have been sold.

~~Dr. Wood was~~ a member of the Board of Trustees of the Girard College, February, 1833, by the City Councils, and served on it till the board was abolished Dec. 23, 1841—eight years. April 1, 1835, he presented a "Report of the Committee on Clothing, Diet, etc., to the Board of Trustees of the Girard College for Orphans;" and July 16, 1840, a "Communication from the Board of Trustees of the Girard College for Orphans to the Select and Common Councils of the City of Philadelphia." This paper is a succinct history of the transactions of the Board from its commencement.

Dr. Wood was always an advocate of temperance. He has recorded his views on "The Temperance Cause" in an essay published in the *United States Review* for January, 1834. He believed that "so long as the advocates of temperance refuse to admit the moderate use of pure fermented liquors, as cider, ale, the light wines, etc., within the meaning of the term, their cause will never be universally nor even generally adopted."

The death of his wife's father, May 10, 1835, placed him in comparatively easy circumstances, and he was soon after enabled to erect a spacious house in which he resided during the remainder of his life.

Oct. 6, 1835, he was elected professor of materia medica and pharmacy in the University of Pennsylvania, in place of Dr. John Rodman Cox. Dr. Wood's lectures on materia medica were demonstrative. In addition to the collection of an admirable cabinet of illustrative drawings and specimens, he erected a spacious green-house in connection with a garden in the rear of his dwelling for the preservation and collection of medicinal plants.<sup>1</sup>

In 1835 he was elected one of the attending physicians of the Pennsylvania Hospital, and served till 1859—twenty-four years.

In his address to the medical graduates at the commencement, March 26, 1836, he gave a "Sketch of the History of the Medical Department of the University of Pennsylvania."

Jan. 23, 1839, he delivered an address on the "British East India Empire," before The Athenian Institute, an association of gentlemen formed for the purpose of promoting literary tastes and habits in Philadelphia. With this view they set on foot a series of weekly lectures, the subject being left to the choice of the lecturer. During the early years of his career, when he had less professional occupation than he desired, Dr. Wood became so much interested in the affairs of India, especially of Hindostan, that he began to qualify himself to write a history of the country, and employed his leisure in preparing a history of Christianity in India in eleven chapters. At this point his increasing professional avocations induced him to abandon the enterprise; but that so much work might not

<sup>1</sup> See Carson's History of the Medical Department of the University of Pennsylvania, Philada., 1869.

be lost, he published it in 1872, in a volume of Historical and Biographical Memoirs.

In 1847 he published his *Treatise on the Practice of Medicine*, 2 vols. 8vo. pp. 1848. The sixth edition, pp. 1984, was published in 1867. The aggregate of copies sold up to this time is estimated at 30,000.

In May, 1850, he was elected professor of the theory and practice of medicine and of clinical medicine in the University of Pennsylvania, in place of Dr. Nathaniel Chapman, resigned. During the summer, accompanied by Dr. Joseph Leidy, he visited England, France, Germany, and the northern part of Italy. The fruits of this journey were a large number of drawings of pathological lesions, casts, and models of disease, a quantity of apparatus, and an extensive range of pathological specimens, ~~by the means of which he made his lectures on the practice of medicine eminently demonstrative.~~

June 10, 1851, at the centennial celebration of its foundation he read his "History of the Pennsylvania Hospital."

In the company of Dr. Franklin Bache he passed the summer of 1853 in Europe.

May 6, 1856, at Detroit, he delivered an address to the American Medical Association of which he had been elected president at the preceding meeting. He was a member of the association from its formation, 1847, and always manifested zealous interest in its great objects, improvement of medical education, increase of the qualification of the members of the profession, and the advancement of medical science.

Oct. 1, 1856, heread his "Historical Sketch of the department of Pennsylvania Hospital for the Insane," at the laying of the corner stone of the new building.

In 1856 he published his *Treatise on Therapeutics and Pharmacology*, two volumes, pp. 1741, 8vo. The third edition, pp. 1848, was issued in 1868. The number of copies sold up to this time is estimated at 10,000.

December, 1859, he published "Introductory Lectures and Addresses on Medical Subjects delivered chiefly before the Medical Classes of the University of Pennsylvania." 8vo. pp. 460.

Having completed the sixty-third year of his life, Dr. Wood determined to relinquish his practice of medicine, which was never very large, and retire. In 1860 he resigned his professorship, and was elected Emeritus Professor of the Theory and Practice of Medicine in the University of Pennsylvania, a position for which a retired pay should be provided for life instead of being merely complimentary. He had been a professor in the University twenty-five years:

May 6, 1860, a complimentary dinner was given to Dr. George B. Wood, at the Academy of Music, "by a large number of his professional friends, in testimony of their respect and esteem for him personally, and of their estimate of the value of his labours to elevate the character of the profession and to extend the bounds of our science. Certainly, no one in this country has better earned this compliment from his professional brethren."<sup>2</sup>

Dr. Wood went to Europe in the summer of 1860 and returned in 1862. In 1863 he was chosen a trustee of the University of Pennsylvania.

At the instigation of Dr. Wood the board of trustees created, April 4, 1865, in connection with the Medical Department of the University, the Auxiliary Faculty of Medicine. The professors receive a salary. It consists of professors of: 1, zoology and comparative anatomy; 2, botany; 3, mineralogy; 4, hygiene; 5, medical jurisprudence and toxicology. Each course consists of at least thirty-

<sup>1</sup> See Carson's History of the Medical Department of the University of Pennsylvania.

<sup>2</sup> The Medical News and Library, June, 1860.

four lectures delivered in April, May, and June. The first courses were delivered in 1866, and are continued.

Dr. Wood paid each professor \$500 annually from the commencement, and bequeathed a fund of \$50,000 from which the payment is to be continued. He also bequeathed to the University his numerous collections, all his medicinal plants, and \$5000 to establish a botanical garden and conservatory, and to the University Hospital \$75,000 to establish in it "the Peter Hahn Ward."

March 4, 1867, Mrs. Wood died. The marriage was without issue.

April, 1872, he published his "Historical and Biographical Memoirs, Essays, Addresses, etc. etc., written at various times during the last fifty years, and now first published in a collected form," 8vo. pp. 576.

The aggregate of Dr. Wood's published writings ~~amounted to~~ 7000 pages 8vo., and, it is understood, he has some manuscripts unprinted. He has achieved nothing in the fields of original research and invention.

He was an uncommonly skilful teacher, an effective writer, and successful author. Most of his study and writing were done during the night, between the hours of 10 P. M. and 4 A. M. He gathered reward as he worked without reckoning the prospective profit of his toil. He wrought incessantly. Even his annual summer journeys to different parts of the United States, or in Europe, seemingly for relaxation alone, always had some object of professional interest to be attained. Those summer jaunts were always made in a somewhat ostentatious style, so that he never appeared to strangers as a commonplace traveller. Though he frequently at home entertained tastefully and sumptuously numerous evening guests, social intercourse in the ordinary sense was not necessary to his happiness. His great pleasure was found in the solitude of his study. He was methodical in his way, painstaking and accurate in his work, and always punctual to the minute of appointment. He seemed to think that society generally is not aware of the incalculable benefits which are derived from the medical profession, independently of the services that the sick and wounded receive from it; that, in the estimation of the unthinking, medical attendance is necessarily personal service, and therefore a sort of servile occupation; and for this reason that the value of the profession is not appreciated as it should be. To make its dignity conspicuous, and place it higher in public estimation, was a lifelong purpose, to be achieved, in his opinion, by augmenting the facilities of the education and increasing the qualifications of its members. This disposition is manifest in his beneficence to the College of Physicians and to the University of Pennsylvania, as well as in his laborious contributions to the progress of the Philadelphia College of Pharmacy, and to giving stability and due authority to the Pharmacopœia, which is ascribable largely to his labours.

Dr. George B. Wood died at his residence in Philadelphia, March 30, 1879, at the advanced age of 82 years, having spent his long life usefully and acceptably in every respect. He was generous, benevolent, charitable in the broadest sense of the term. His character is without stain.

W. S. W. R.

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## BOYLSTON MEDICAL PRIZE QUESTIONS.

The Boylston Medical Committee, appointed by the President and Fellows of Harvard University, consists of the following Physicians:—

D. H. STORER, M.D.,  
MORRILL WYMAN, M.D.,  
HENRY J. BIGELOW, M.D.,

RICHARD M. HODGES, M.D.,  
CALVIN ELLIS, M.D.,  
SAMUEL CABOT, M.D.

At the annual meeting, held June 9, 1879, it was voted that no dissertation worthy of a prize had been offered on either of the subjects proposed for 1879.

The following are the questions proposed for 1880:—

1. Antiseptic Treatment. What are its Essential Details? How are they best carried out in Practical Form?

2. Diphtheria. Its Causes, Diagnosis, and Treatment.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1880, will be entitled to a premium of One Hundred and Fifty Dollars.

Dissertations on the above subjects must be transmitted, post-paid, to D. H. Storer, M.D., 182 Boylston St., Boston, *on or before the first Wednesday in April, 1880.*

The following are the questions proposed for 1881:—

1. The Effects of Drugs, during Lactation, on either nurse or nursing.

2. Injuries to the Back, without apparent mechanical lesion in their surgical and medico-legal aspects.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1881, will be entitled to a premium of Three Hundred Dollars.

Dissertations on these subjects must be transmitted as above, on or before the first Wednesday in April, 1881.

Each dissertation must be accompanied by a sealed packet on which shall be written some device or sentence, and within which shall be inclosed the author's name and residence. The same device or sentence is to be written on the dissertation to which the packet is attached.

The writer of each dissertation is expected to transmit his communication to the President of the Committee, D. H. Storer, M.D., in a distinct and plain handwriting, and with the pages bound in book form within the time specified.

*Any clew by which the authorship of a dissertation is made known to the Committee will debar such dissertation from competition.*

Preference will be given to dissertations which exhibit original work.

All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

1st. That the Board do not consider themselves as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

2d. That in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

RICHARD M. HODGES, M.D., *Sec'y*, Boston, Mass.

Publishers of Newspapers and Medical Journals throughout the country are respectfully requested to notice the above.

# BELLEVUE HOSPITAL MEDICAL COLLEGE,

## CITY OF NEW YORK.

### MEMBER OF THE AMERICAN MEDICAL COLLEGE ASSOCIATION.

### SESSIONS OF 1879-'80.

THE COLLEGIATE YEAR in this Institution embraces a preliminary Autumnal Term, the Regular Session, and a Spring Session.

THE AUTUMNAL TERM for 1879-'80 will begin on Wednesday, September 17th, 1879, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures upon special subjects and daily clinical lectures, will be given, as heretofore, by the entire Faculty, in the same number and order as during the Regular Session. Students expecting to attend the Regular Session are recommended to attend the Preliminary Term, but such attendance is not required.

THE REGULAR SESSION begins on Wednesday, October 1, 1879, and end about the 1st of March, 1880. During this Session, in addition to four didactic lectures every week-day except Saturday, two or three hours are daily allotted to clinical instruction.

THE SPRING SESSION consists chiefly of recitations from Text-Books. This Session begins on the 1st of March and continues until the 1st of June. During this Session, daily recitations in all the departments are held by a corps of examiners appointed by the Faculty. Short courses of lectures are given on special subjects, and regular clinics are held in the Hospital and in the College building.

### FACULTY.

ISAAC E. TAYLOR, M.D., Emeritus Professor of Obstetrics and Diseases of Women, and President of the Faculty.	
JAMES R. WOOD, M.D., LL.D., Emeritus Professor of Surgery.	FORDYCE BARKER, M.D., LL.D., Professor of Clinical Midwifery and Diseases of Women.
AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine and Clinical Medicine.	A. A. SMITH, M.D., Lecturer on Materia Medica and Therapeutics, and Clinical Medicine.
W. H. VAN BUREN, M.D., Prof. of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.	AUSTIN FLINT, JR., M.D., Professor of Physiology and Physiological Anatomy, and Secretary of the Faculty.
LEWIS A. SAYRE, M.D., Professor of Orthopedic Surgery and Clinical Surgery.	JOSEPH D. BRYANT, M.D., Prof. of General, Descriptive, and Surgical Anatomy.
ALEXANDER B. MOTT, M.D., Professor of Clinical and Operative Surgery.	R. OGDEN DOREMUS, M.D., LL.D., Professor of Chemistry and Toxicology.
WILLIAM T. LUSK, M.D., Prof. of Obstetrics and Diseases of Women and Children, and Clinical Midwifery.	EDWARD G. JANEWAY, M.D., Professor of Pathological Anatomy and Histology, Diseases of the Nervous System, and Clinical Medicine.

### PROFESSORS OF SPECIAL DEPARTMENTS, ETC.

HENRY D. NOYES, M.D., Professor of Ophthalmology and Otolary.	JOSEPH W. HOWE, M.D., Clinical Professor of Surgery.
J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children.	BEVERLY ROBINSON, M.D., Lecturer upon Clinical Medicine.
EDWARD L. KEYES, M.D., Professor of Dermatology, and Adjunct to the Chair of Principles of Surgery.	FRANK H. BOSWORTH, M.D., Lecturer upon Diseases of the Throat.
JOHN P. GRAY, M.D., LL.D., Professor of Medicine and Clinical Medicine.	CHARLES A. DOREMUS, M.D., PH.D., Lecturer upon Practical Chemistry and Toxicology.
LEWIS A. SAYRE, M.D., Clinical Professor of Surgery.	FREDERICK S. DENNIS, M.D., M.R.C.S., Demonstrators of Anatomy.
LEROY MILTON YALE, M.D., Lecturer Adjunct upon Orthopedic Surgery.	WILLIAM H. WELCH, M.D., Demonstrators of Anatomy.

### FEES FOR THE REGULAR SESSION:

Fees for Tickets to all the Lectures during the Preliminary and } Regular Term, including Clinical Lectures, }	\$140 00
Matriculation Fee .....	5 00
Dissection Fee (including material for dissection) .....	10 00
Graduation Fee .....	20 00

### FEES FOR THE SPRING SESSION:

Matriculation (Ticket valid for the following Winter) .....	\$5 00
Recitations, Clinics, and Lectures .....	35 00
Dissection (Ticket valid for the following Winter) .....	10 00

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT, JR., Secretary, Bellevue Hospital Medical College.

## MEDICAL DEPARTMENT OF THE UNIVERSITY OF LOUISIANA—NEW ORLEANS.

### FACULTY.

- T. G. RICHARDSON, M.D., Professor of General and Clinical Surgery.  
 SAMUEL M. BEMISS, M.D., Professor of the Theory and Practice of Medicine and Clinical Medicine.  
 STANFORD E. CHAILLÉ, M.D., Professor of Physiology and Pathological Anatomy.  
 JOSEPH JONES, M.D., Professor of Chemistry and Clinical Medicine.  
 SAMUEL LOGAN, M.D., Professor of Anatomy and Clinical Surgery.  
 ERNEST S. LEWIS, M.D., Professor of General and Clinical Obstetrics and Diseases of Women and Children.  
 JOHN B. ELLIOTT, M.D., Professor of Materia Medica and Therapeutics and Clinical Medicine.  
 ALBERT B. MILES, Demonstrator of Anatomy.

The next annual course of instruction in this Department (now in the forty-sixth year of its existence) will commence on Monday, the 20th day of October, 1879, and terminate on Saturday, the 14th day of March, 1880. The first three weeks of the term will be devoted exclusively to Clinical Medicine and Surgery at the Charity Hospital; Practical Chemistry in the Laboratory; and dissections in the spacious and airy Anatomical Rooms of the University.

The means of teaching now at the command of the Faculty are unsurpassed in the United States. Special attention is called to the opportunities presented for

### CLINICAL INSTRUCTION.

The Act establishing the University of Louisiana gives the Professors of the Medical Department the use of the great Charity Hospital as a school of practical instruction.

The Charity Hospital contains nearly 700 beds, and received, during the last year, more than six thousand patients. Its advantages for professional study are unsurpassed by any similar institution in this country. The Medical, Surgical, and Obstetrical Wards are visited by the respective professors in charge daily, from eight to ten o'clock A. M., at which time all the students are expected to attend and familiarize themselves, *at the bedside of the patients*, with the diagnosis and treatment of all forms of injury and disease.

The regular lectures at the hospital, on Clinical Medicine by Professors Bemiss, Elliott, and Joseph Jones, Surgery by Professors Richardson and Logan, Diseases of Women and Children by Professor Lewis, and Special Pathological Anatomy by Professor Chaillé, will be delivered in the amphitheatre on Monday, Wednesday, Thursday, and Saturday, from 10 to 12 o'clock A. M.

The administrators of the hospital elect annually, by competitive examinations, *twelve resident students*, who are maintained by the institution.

### TERMS.

For the Tickets of all the Professors . . . . .	\$140 00
For the Ticket of Practical Anatomy . . . . .	10 00
Matriculation Fee . . . . .	5 00
Graduation Fee . . . . .	30 00

Candidates for graduation are required to be twenty-one years of age; to have studied three years; to have attended two courses of lectures, and to pass a satisfactory examination.

Graduates of other respectable schools are admitted upon payment of the Matriculation and half lecture fees. They cannot, however, obtain the Diploma of the University without passing the regular examinations and paying the usual Graduation Fee.

As the practical advantages here afforded for a thorough acquaintance with all the branches of medicine and surgery are *quite equal* to those possessed by the schools of New York and Philadelphia, the same fees are charged.

For further information, address

T. G. RICHARDSON, M.D., *Dean*.

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